



# ***MULTI V™***

## **WALL-MOUNTED INDOOR UNIT INSTALLATION MANUAL**



***Art Cool™ Mirror Wall-Mounted***  
***5,500 to 24,200 Btu/h***



***Standard Wall-Mounted***  
***5,500 to 35,500 Btu/h***



***Art Cool™ Gallery***  
***9,600 and 12,300 Btu/h***

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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. A summary of safety precautions begins on page 4.*

*For more technical materials such as submittals, engineering databooks, and catalogs, visit [www.lghvac.com](http://www.lghvac.com).*

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The instructions below 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 below.

## TABLE OF SYMBOLS

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

## INSTALLATION

### **DANGER**

**Don't use or store flammable gas or combustibles near the unit.**  
*There is risk of product failure, fire, explosion, and physical injury or death.*

### **WARNING**

**Do not install, remove the unit by yourself (customer). Ask the dealer or an authorized technician to install the unit.**  
*Improper installation by the user may result in water leakage, fire, explosion, electric shock, physical injury or death.*

**For replacement of an installed unit, always contact a trained LG 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 may enter the unit, causing fire, electric shock, and physical injury or death.*

**Always check for system refrigerant leaks after the unit has been installed or serviced.**  
*Exposure to high concentration levels of refrigerant gas may 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.*

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

**Dispose the packing materials safely.**  
 • *Packing materials, such as nails and other metal or wooden parts may cause puncture wounds or other injuries.*  
 • *Tear apart and throw away plastic packaging bags so that children may 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 earthquakes.**  
*Improper installation may 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.*

**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*



## INSTALLATION – CONTINUED

### **⚠ CAUTION**

**Be very careful when transporting the product.**

- Ⓞ 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 uninsulated pipe can generate condensate that may drip and cause a slippery floor 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 may cause the air conditioner to operate improperly. The unit may 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 be damaged.*

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

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

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

**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.*

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

*There is risk of product failure.*

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

*Low refrigerant levels may 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.*

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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.**

**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.*

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### 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 equipment malfunction, property damage, personal 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 may 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 may 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 may generate heat, cause a fire and physical injury or death.*

**Properly tighten all power connections.**

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

#### 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.*

## 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.*

**Periodically verify the hanging bolts and other hardware securing the unit have 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 may cause fire, electric shock, explosion, 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 the 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 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.*

⊘ **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.*

**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.*

### **⚠ 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) may result in severe bearing damage to the compressor(s). Keep the power switch on during the operational season.*

⊘ **Do not block the inlet or outlet.**

*Unit may 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.*

## Gallery and Wall-Mounted Indoor Units

This manual describes how to install LG Art Cool™ Gallery, Standard, and Art Cool™ Mirror Wall-Mounted indoor units (IDU) for Multi V Variable Refrigerant Flow (VRF) heat pump and heat recovery systems. Table 1 lists the available models. Refer to LG's Multi V 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 your 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.

#### Applicable Codes

Personnel must be familiar with and follow the applicable national, state, and/or local codes. In the event of a conflict between any applicable code and the instructions in this manual, comply with the applicable code.

### **⚠ 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 and can prevent proper operation of the unit.*

#### **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.*

Figure 1: Art Cool Gallery (Gen 4) Indoor Unit.



Figure 2: Standard Wall-Mounted Indoor Unit.



Figure 3: Art Cool Mirror Wall-Mounted Indoor Unit.



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## Required Parts (factory provided)

### Art Cool Gallery (Gen 4) Indoor Units

- Installation guide (One [1] Each)
- Type "A" screws (Four [4] Each)
- Plastic anchors (Four [4] Each)

### Standard and Art Cool Mirror (Gen 4) Wall-Mounted Indoor Units

- Installation plate (One [1] Each)
- Type "A" screws (Five [5] Each)
- Plastic anchors (Five [5] Each)
- Type "B" screws (Two [2] Each)





## Required Parts (field provided)

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

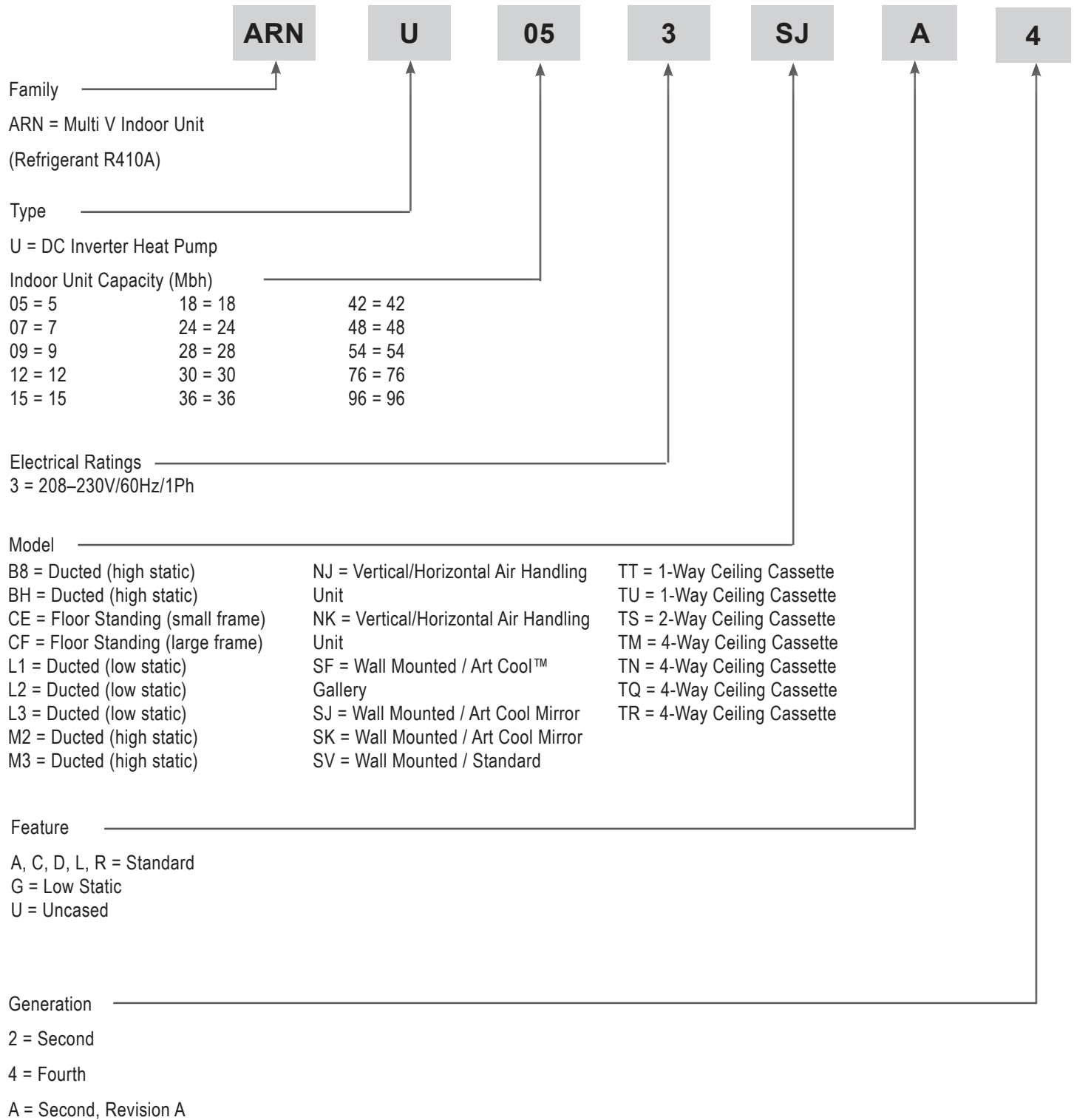
## Required Tools (field provided)

- Level
- JIS and other screwdrivers
- Electrical lineman pliers
- Electric drill
- Holesaw
- Drill
- Flaring tool set
- Tubing cutter
- Tube/pipe reamer
- Torque wrenches
- Allen wrench
- Gas-leak detector
- Thermometer

Table 1: Multi V Wall-Mounted Indoor Units

Unit	Model Number
ART COOL Gallery (Gen 4) 	ARNU093SFA4
	ARNU123SFA4
Standard (Gen 4) 	ARNU053SJA4
	ARNU073SJA4
	ARNU093SJA4
	ARNU123SJA4
	ARNU153SJA4
	ARNU183SKA4
ARNU243SKA4	
Standard (Gen 4) 	ARNU303SVA4
	ARNU363SVA4
ART COOL Mirror (Gen 4) 	ARNU053SJR4
	ARNU073SJR4
	ARNU093SJR4
	ARNU123SJR4
	ARNU153SJR4
	ARNU183SKR4
ARNU243SKR4	

Multi V Wall-Mounted Indoor Unit



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## R410A Refrigerant

R410A refrigerant has a higher operating pressure in comparison to R22 refrigerant and, therefore, 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, so the ozone depletion potential (ODP) is 0.

### **⚠ WARNING**

⊘ Do not place refrigerant cylinder in direct sunlight. Refrigerant cylinder may 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 may 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 may fail when pressurized.

## Refrigerant Safety

### **⚠ WARNING**

Verify the maximum refrigerant concentration level in the space where the indoor unit will be mounted meets the concentration limit for the application.

ASHRAE Standards 15-2010 and 34-2010 offer guidelines that address refrigerant safety and the maximum allowable concentration of refrigerant in an occupied space. Refrigerant will dissipate into the atmosphere, but a certain volume of air is required for this to occur safely. For R410A refrigerant, the maximum allowable concentration of refrigerant is twenty-six (26) lbs. per 1,000 cubic feet of an occupied space. Buildings with twenty-four (24) hour occupancy allow half of that concentration.<sup>1</sup>

ASHRAE Standards 15 and 34 assume that if a system develops a leak, its entire refrigerant charge will dump into the area where the leak occurs. To meet ASHRAE Standards 15 and 34, calculate the refrigerant concentration that may occur in the smallest room volume on the system, and compare the results to the maximum allowable concentration number.<sup>1</sup> Also consult state and local codes in regards to refrigerant safety.

<sup>1</sup>Information about ASHRAE Standard 15-2010/34-2010 and addenda current as of the date of this publication.



Table 2: Art Cool Gallery (SF Frames) Indoor Unit General Data

Model No.	ARNU093SFA4	ARNU123SFA4
<b>Cooling Mode Performance</b>		
Capacity (Btu/h)	9,600	12,300
Max. Power Input <sup>1</sup> (W)	35	35
H/M/L Power Input at Factory Default (W)	28 / 16 / 10	32 / 20 / 12
<b>Heating Mode Performance</b>		
Capacity (Btu/h)	10,900	13,600
Max. Power Input <sup>1</sup> (W)	35	35
H/M/L Power Input at Factory Default (W)	28 / 16 / 10	32 / 20 / 12
<b>Entering Mixed Air</b>		
Cooling Max (°F WB) <sup>2</sup>	76	76
Heating Min (°F DB) <sup>2</sup>	59	59
<b>Unit Data</b>		
Refrigerant Type <sup>3</sup>	R410A	R410A
Refrigerant Control	EEV	EEV
Sound Pressure <sup>4</sup> dB(A) (H/M/L)	38 / 32 / 27	44 / 38 / 32
Net Unit Weight (lbs.)	33.1	33.1
Shipping Weight (lbs.)	38.1	38.1
Communication Cable <sup>5</sup> (No. x AWG)	2 x 18	2 x 18
<b>Fan</b>		
Type	Turbo Fan	Turbo Fan
Quantity	1	1
Motor/Drive	Brushless Digitally Controlled / Direct	
Airflow Rate H/M/L (CFM)	286 / 222 / 148	328 / 272 / 212
<b>Piping</b>		
Liquid Line (in., O.D.)	1/4 Flare	1/4 Flare
Vapor Line (in., O.D.)	1/2 Flare	1/2 Flare
Condensate Line (in., I.D.)	5/8	5/8

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes.

This unit comes with a dry nitrogen charge.

All capacities are net with a combination ratio between 95-105%.

Rated capacity is certified under AHRI Standard 1230. Ratings are subject to change without notice. Current certified ratings are available at [www.ahridirectory.org](http://www.ahridirectory.org).

<sup>1</sup>Max. power input is rated at maximum setting value.

<sup>2</sup>Low ambient performance with LGRED<sup>®</sup> heat technology is included in Multi V 5 Air Source Units produced after February 2019.

<sup>3</sup>Take appropriate actions at the end of HVAC equipment life to recover, recycle, reclaim or destroy R410A refrigerant according to applicable regulations (40 CFR Part 82, Subpart F) under section 608 of CAA.

<sup>4</sup>Sound Pressure levels are tested in an anechoic chamber under ISO Standard 3745.

<sup>5</sup>All communication cable to be minimum 18 AWG, 2-conductor, twisted, stranded, shielded and must comply with applicable local and national codes. Ensure the communication cable is properly grounded at the master outdoor unit only. ⚠ Do not ground the ODU-IDU communication cable at any other point.

# ART COOL GALLERY



## Electrical Data

Table 3: Art Cool Mirror Wall-Mounted Indoor Unit Electrical Data.

Model Number	Voltage Range	MCA	MOP	Rated Amps (A)	Power Supply			Power Input (W)		
					Hz	Volts	Phase	Max. Cooling	Max. Heating	H / M / L at Factory Default
<b>SF Frames</b>										
ARNU093SFA4	187-253	0.4	15	0.3	60	208-230V	1	35	35	28 / 16 / 10
ARNU123SFA4										32 / 20 / 12

MCA : Minimum Circuit Ampacity.

MOP : Maximum Overcurrent Protection.

Units are suitable for use on an electrical system where voltage supplied to unit terminals is within the listed range limits.

Select wire size based on the larger MCA value.

Instead of fuse, use the circuit breaker.

Max. power input is rated at maximum setting value.

Multi V Wall-Mounted Indoor Unit

Table 4: Art Cool Mirror Wall-Mounted (SJ, SK Frames) Indoor Unit General Data.

Model No.	ARNU053SJR4	ARNU073SJR4	ARNU093SJR4	ARNU123SJR4	ARNU153SJR4	ARNU183SKR4	ARNU243SKR4
<b>Cooling Mode Performance</b>							
Capacity (Btu/h)	5,500	7,500	9,600	12,300	15,400	19,100	24,200
Max. Power Input <sup>1</sup> (W)	30	30	30	30	30	53	53
H/M/L Power Input at Factory Default (W)	11 / 10 / 9	12 / 11 / 9	13 / 12 / 9	15 / 13 / 11	23 / 18 / 11	32 / 26 / 16	39 / 26 / 16
<b>Heating Mode Performance</b>							
Capacity (Btu/h)	6,100	8,500	10,900	13,600	17,100	21,500	25,600
Max. Power Input <sup>1</sup> (W)	30	30	30	30	30	53	53
H/M/L Power Input at Factory Default (W)	11 / 10 / 9	12 / 11 / 9	13 / 12 / 9	15 / 13 / 11	23 / 18 / 11	32 / 26 / 16	39 / 26 / 16
<b>Entering Mixed Air</b>							
Cooling Max (°F WB) <sup>2</sup>	76	76	76	76	76	76	76
Heating Min (°F DB) <sup>2</sup>	59	59	59	59	59	59	59
<b>Unit Data</b>							
Refrigerant Type <sup>3</sup>	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant Control	EEV	EEV	EEV	EEV	EEV	EEV	EEV
Sound Pressure <sup>4</sup> dB(A) (H/M/L)	30 / 29 / 28	32 / 30 / 28	34 / 32 / 28	37 / 34 / 30	42 / 39 / 32	43 / 39 / 34	46 / 41 / 34
Net Unit Weight (lbs.)	20.2	20.2	20.2	20.2	20.2	29.5	29.5
Shipping Weight (lbs.)	27.7	27.7	27.7	27.7	27.7	38.8	38.8
Communication Cable <sup>5</sup> (No. x AWG)	2 x 18	2 x 18	2 x 18	2 x 18	2 x 18	2 x 18	2 x 18
<b>Fan</b>							
Type	Cross Flow	Cross Flow	Cross Flow	Cross Flow	Cross Flow	Cross Flow	Cross Flow
Quantity	1	1	1	1	1	1	1
Motor / Drive	Brushless Digitally Controlled / Direct						
Airflow Rate H/M/L (CFM)	240 / 230 / 208	254 / 240 / 208	275 / 254 / 208	300 / 254 / 240	371 / 336 / 240	494 / 424 / 371	537 / 449 / 371
<b>Piping</b>							
Liquid Line (in., O.D.)	1/4 Flare	1/4 Flare	1/4 Flare	1/4 Flare	1/4 Flare	1/4 Flare	3/8 Flare
Vapor Line (in., O.D.)	1/2 Flare	1/2 Flare	1/2 Flare	1/2 Flare	1/2 Flare	1/2 Flare	5/8 Flare
Condensate Line (in., I.D.)	5/8	5/8	5/8	5/8	5/8	5/8	5/8

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes.

This unit comes with a dry nitrogen charge.

All capacities are net with a combination ratio between 95-105%.

Rated capacity is certified under AHRI Standard 1230. Ratings are subject to change without notice. Current certified ratings are available at [www.ahridirectory.org](http://www.ahridirectory.org).

<sup>1</sup>Max. power input is rated at maximum setting value.

<sup>2</sup>Low ambient performance with LGRED<sup>®</sup> heat technology is included in Multi V 5 Air Source Units produced after February 2019.

<sup>3</sup>Take appropriate actions at the end of HVAC equipment life to recover, recycle, reclaim or destroy R410A refrigerant according to applicable regulations (40 CFR Part 82, Subpart F) under section 608 of CAA.

<sup>4</sup>Sound Pressure levels are tested in an anechoic chamber under ISO Standard 3745.

<sup>5</sup>All communication cable to be minimum 18 AWG, 2-conductor, twisted, stranded, shielded and must comply with applicable local and national codes. Ensure the communication cable is properly grounded at the master outdoor unit only. Ⓞ Do not ground the ODU-IDU communication cable at any other point.

# ART COOL MIRROR



## Electrical Data

Table 5: Art Cool Mirror Wall-Mounted Indoor Unit Electrical Data.

Model Number	Voltage Range	MCA	MOP	Rated Amps (A)	Power Supply			Power Input (W)		
					Hz	Volts	Phase	Max. Cooling	Max. Heating	H / M/ L at Factory Default
<b>SJ Frames</b>										
ARNU053SJR4	187-253	0.31	15	0.25	60	208-230V	1	30	30	11 / 10 / 9
ARNU073SJR4		0.31		0.25				30	30	12 / 11 / 9
ARNU093SJR4		0.31		0.25				30	30	13 / 12 / 9
ARNU123SJR4		0.31		0.25				30	30	15 / 13 / 11
ARNU153SJR4		0.31		0.25				30	30	23 / 18 / 11
<b>SK Frames</b>										
ARNU183SKR4	187-253	0.65	15	0.52	60	208-230V	1	53	53	32 / 26 / 16
ARNU243SKR4		0.65		0.52				53	53	39 / 26 / 16

MCA : Minimum Circuit Ampacity.

MOP : Maximum Overcurrent Protection.

Units are suitable for use on an electrical system where voltage supplied to unit terminals is within the listed range limits.

Select wire size based on the larger MCA value.

Instead of fuse, use the circuit breaker.

Max. power input is rated at maximum setting value.

Table 6: Standard Wall-Mounted (SJ Frames) Indoor Unit General Data.

Model No.	ARNU053SJA4	ARNU073SJA4	ARNU093SJA4	ARNU123SJA4	ARNU153SJA4
<b>Cooling Mode Performance</b>					
Capacity (Btu/h)	5,500	7,500	9,600	12,300	15,400
Max. Power Input <sup>1</sup> (W)	30	30	30	30	30
H/M/L Power Input at Factory Default (W)	11 / 10 / 9	12 / 11 / 9	13 / 12 / 9	15 / 13 / 11	23 / 18 / 11
<b>Heating Mode Performance</b>					
Capacity (Btu/h)	6,100	8,500	10,900	13,600	17,100
Max. Power Input <sup>1</sup> (W)	30	30	30	30	30
H/M/L Power Input at Factory Default (W)	11 / 10 / 9	12 / 11 / 9	13 / 12 / 9	15 / 13 / 11	23 / 18 / 11
<b>Entering Mixed Air</b>					
Cooling Max (°F WB) <sup>2</sup>	76	76	76	76	76
Heating Min (°F DB) <sup>2</sup>	59	59	59	59	59
<b>Unit Data</b>					
Refrigerant Type <sup>3</sup>	R410A	R410A	R410A	R410A	R410A
Refrigerant Control	EEV	EEV	EEV	EEV	EEV
Sound Pressure <sup>4</sup> dB(A) (H/M/L)	30 / 29 / 28	32 / 30 / 28	34 / 32 / 28	37 / 34 / 30	42 / 39 / 32
Net Unit Weight (lbs.)	18.5	18.5	18.5	18.5	18.5
Shipping Weight (lbs.)	24.9	24.9	24.9	24.9	24.9
Communication Cable <sup>5</sup> (No. x AWG)	2 x 18	2 x 18	2 x 18	2 x 18	2 x 18
<b>Fan</b>					
Type	Cross Flow	Cross Flow	Cross Flow	Cross Flow	Cross Flow
Quantity	1	1	1	1	1
Motor/Drive	Brushless Digitally Controlled / Direct				
Airflow Rate H/M/L (CFM)	240 / 230 / 208	254 / 240 / 208	275 / 254 / 208	300 / 254 / 240	371 / 336 / 240
<b>Piping</b>					
Liquid Line (in., O.D.)	1/4 Flare	1/4 Flare	1/4 Flare	1/4 Flare	1/4 Flare
Vapor Line (in., O.D.)	1/2 Flare	1/2 Flare	1/2 Flare	1/2 Flare	1/2 Flare
Condensate Line (in., I.D.)	5/8	5/8	5/8	5/8	5/8

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes.

This unit comes with a dry nitrogen charge.

All capacities are net with a combination ratio between 95-105%.

Rated capacity is certified under AHRI Standard 1230. Ratings are subject to change without notice. Current certified ratings are available at [www.ahridirectory.org](http://www.ahridirectory.org).

<sup>1</sup>Max. power input is rated at maximum setting value.

<sup>2</sup>Low ambient performance with LGRED<sup>®</sup> heat technology is included in Multi V 5 Air Source Units produced after February 2019.

<sup>3</sup>Take appropriate actions at the end of HVAC equipment life to recover, recycle, reclaim or destroy R410A refrigerant according to applicable regulations (40 CFR Part 82, Subpart F) under section 608 of CAA.

<sup>4</sup>Sound Pressure levels are tested in an anechoic chamber under ISO Standard 3745.

<sup>5</sup>All communication cable to be minimum 18 AWG, 2-conductor, twisted, stranded, shielded and must comply with applicable local and national codes. Ensure the communication cable is properly grounded at the master outdoor unit only. Ⓞ Do not ground the ODU-IDU communication cable at any other point.

# STANDARD WALL-MOUNTED



## General Data

Table 7: Standard Wall-Mounted (SK and SV Frames) Indoor Unit General Data.

Model No.	ARNU183SKA4	ARNU243SKA4	ARNU303SVA4	ARNU363SVA4
<b>Cooling Mode Performance</b>				
Capacity (Btu/h)	19,100	24,200	30,000	35,500
Max. Power Input <sup>1</sup> (W)	53	53	67.0	104.0
H/M/L Power Input at Factory Default (W)	32 / 26 / 16	39 / 26 / 16	54 / 43 / 31	85 / 51 / 36
<b>Heating Mode Performance</b>				
Capacity (Btu/h)	21,500	25,600	32,000	37,000
Max. Power Input <sup>1</sup> (W)	53	53	67.0	104.0
H/M/L Power Input at Factory Default (W)	32 / 26 / 16	39 / 26 / 16	54 / 43 / 31	85 / 51 / 36
<b>Entering Mixed Air</b>				
Cooling Max (°F WB) <sup>2</sup>	76	76	76	76
Heating Min (°F DB) <sup>2</sup>	59	59	59	59
<b>Unit Data</b>				
Refrigerant Type <sup>3</sup>	R410A	R410A	R410A	R410A
Refrigerant Control	EEV	EEV	EEV	EEV
Sound Pressure <sup>4</sup> dB(A) (H/M/L)	43 / 39 / 34	46 / 41 / 34	49 / 44 / 42	52 / 47 / 43
Net Unit Weight (lbs.)	26.9	26.9	37	37
Shipping Weight (lbs.)	35.3	35.3	48	48
Communication Cable <sup>5</sup> (No. x AWG)	2 x 18	2 x 18	2 x 18	2 x 18
<b>Fan</b>				
Type	Cross Flow	Cross Flow	Cross Flow	Cross Flow
Quantity	1	1	1	1
Motor/Drive	Brushless Digitally Controlled / Direct			
Airflow Rate H/M/L (CFM)	494 / 424 / 371	537 / 449 / 371	812 / 706 / 600	918 / 812 / 671
<b>Piping</b>				
Liquid Line (in., O.D.)	1/4 Flare	3/8 Flare	3/8 Flare	3/8 Flare
Vapor Line (in., O.D.)	1/2 Flare	5/8 Flare	5/8 Flare	5/8 Flare
Condensate Line (in., I.D.)	5/8	5/8	5/8	5/8?

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes.

This unit comes with a dry nitrogen charge.

All capacities are net with a combination ratio between 95-105%.

Rated capacity is certified under AHRI Standard 1230. Ratings are subject to change without notice. Current certified ratings are available at [www.ahridirectory.org](http://www.ahridirectory.org).

<sup>1</sup>Max. power input is rated at maximum setting value.

<sup>2</sup>Low ambient performance with LGRED<sup>®</sup> heat technology is included in Multi V 5 Air Source Units produced after February 2019.

<sup>3</sup>Take appropriate actions at the end of HVAC equipment life to recover, recycle, reclaim or destroy R410A refrigerant according to applicable regulations (40 CFR Part 82, Subpart F) under section 608 of CAA.

<sup>4</sup>Sound Pressure levels are tested in an anechoic chamber under ISO Standard 3745.

<sup>5</sup>All communication cable to be minimum 18 AWG, 2-conductor, twisted, stranded, shielded and must comply with applicable local and national codes. Ensure the communication cable is properly grounded at the master outdoor unit only. Ⓞ Do not ground the ODU-IDU communication cable at any other point.

Table 8: Standard Wall-Mounted Indoor Unit Electrical Data.

Model Number	Voltage Range	MCA	MOP	Rated Amps (A)	Power Supply			Power Input (W)		
					Hz	Volts	Phase	Max. Cooling	Max. Heating	H / M/ L at Factory Default
<b>SJ Frames</b>										
ARNU053SJA4	187-253	0.31	15	0.25	60	208-230	1	30	30	11 / 10 / 9
ARNU073SJA4		0.31		0.25				30	30	12 / 11 / 9
ARNU093SJA4		0.31		0.25				30	30	13 / 12 / 9
ARNU123SJA4		0.31		0.25				30	30	15 / 13 / 11
ARNU153SJA4		0.31		0.25				30	30	23 / 18 / 11
<b>SK Frames</b>										
ARNU183SKA4	187-253	0.65	15	0.52	60	208-230	1	53	53	32 / 26 / 16
ARNU243SKA4		0.65		0.52				53	53	39 / 26 / 16
<b>SV Frames</b>										
ARNU303SVA4	187-253	0.64	15	0.51	60	208-230	1	67.0	67.0	54 / 43 / 31
ARNU363SVA4		1.02		0.81				104.0	104.0	85 / 51 / 36

MCA : Minimum Circuit Ampacity.

MOP : Maximum Overcurrent Protection.

Units are suitable for use on an electrical system where voltage supplied to unit terminals is within the listed range limits.

Select wire size based on the larger MCA value.

Instead of fuse, use the circuit breaker.

Max. power input is rated at maximum setting value.

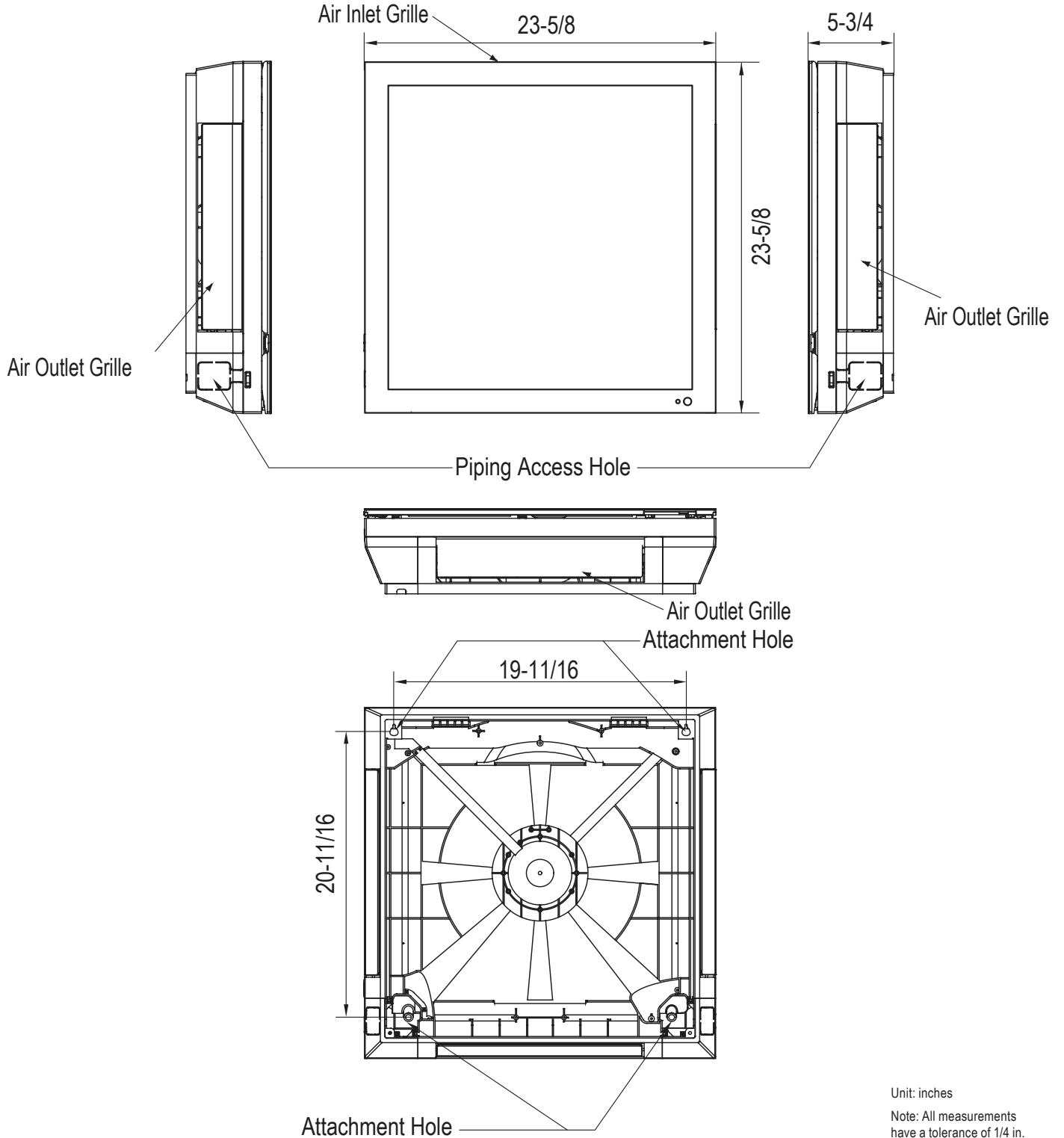
# ART COOL™ GALLERY



## External Dimensions

### SF Frame

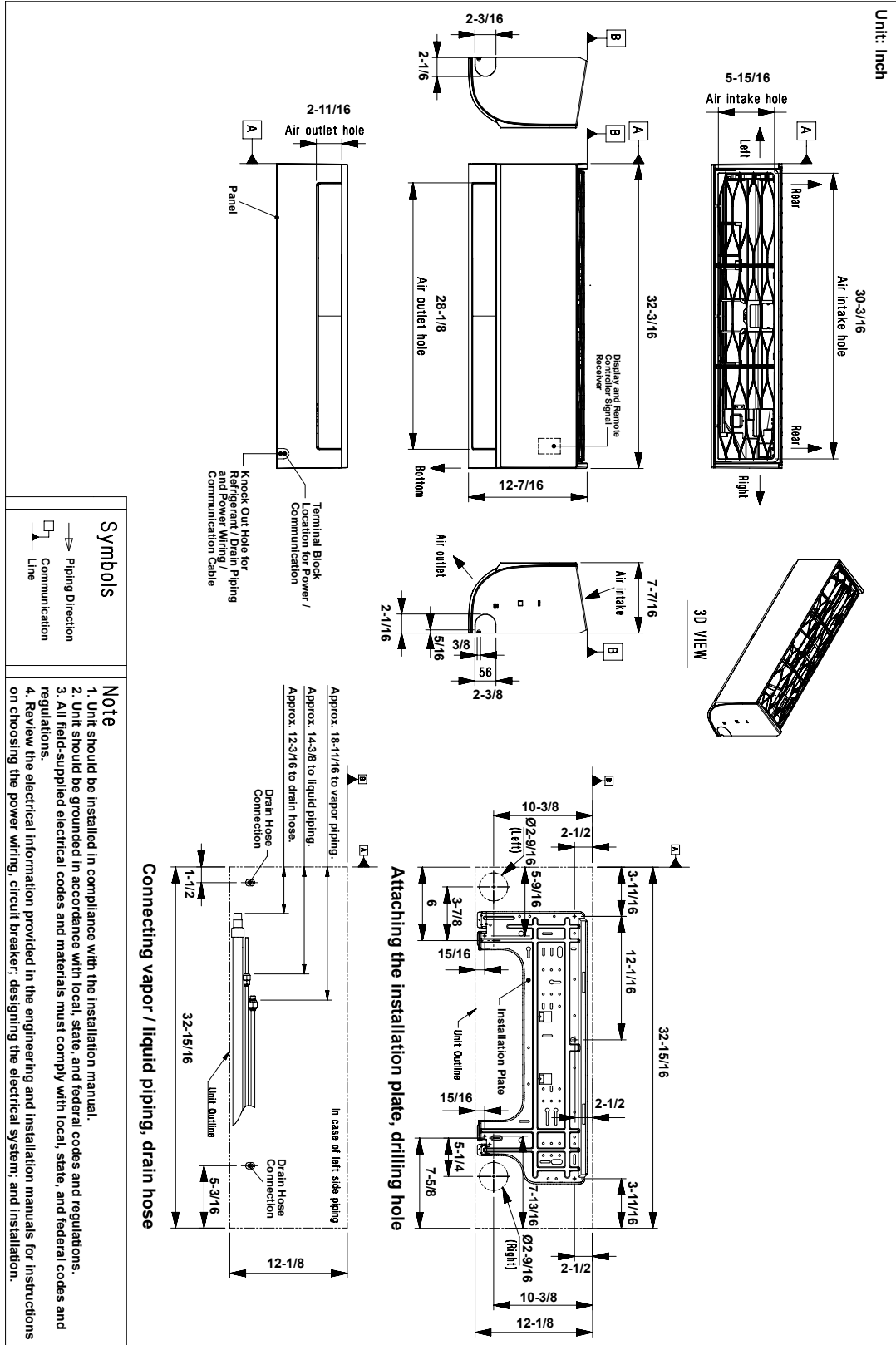
Figure 4: ARNU093SFA4, ARNU123SFA4 Dimensions.



Unit: inches  
Note: All measurements have a tolerance of 1/4 in.



Figure 5: ARNU053SJA4, ARNU073SJA4, ARNU093SJA4, ARNU123SJA4, ARNU153SJA4 Dimensions.



# STANDARD WALL-MOUNTED



## External Dimensions

### SK Frame

Figure 6: ARNU183SKA4, ARNU243SKA4 Dimensions.

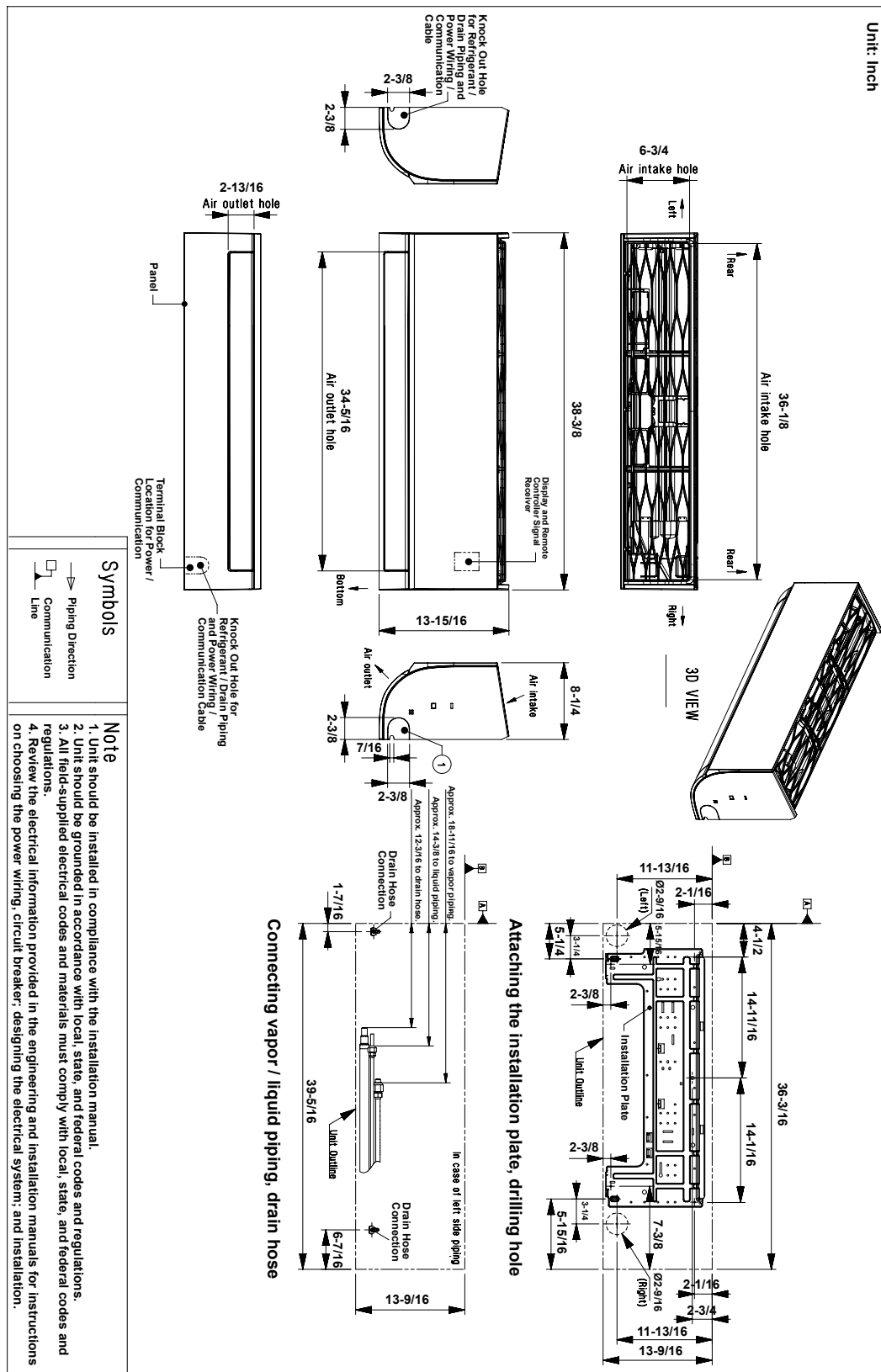
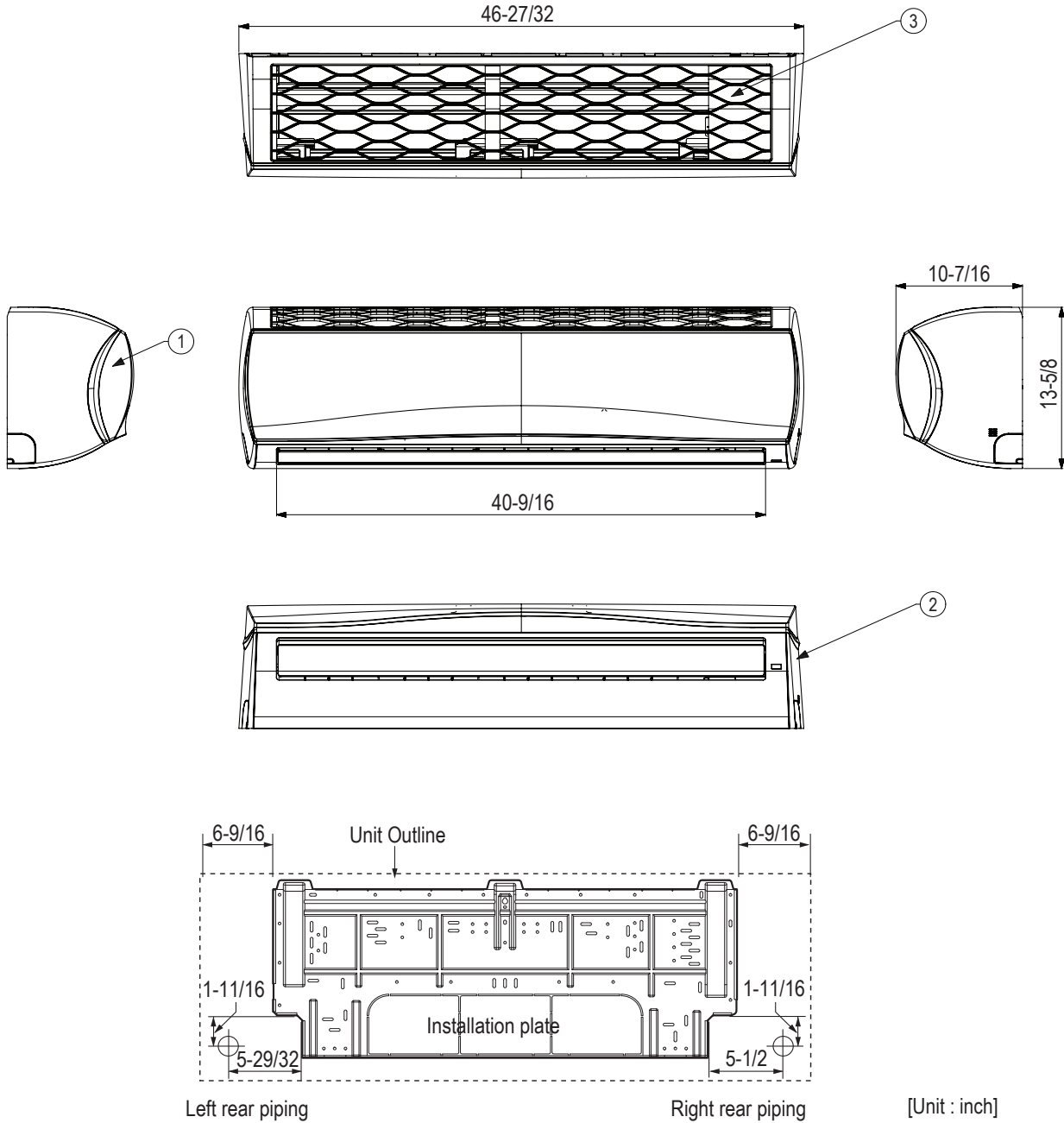


Figure 7: ARNU303SVA4, ARNU363SVA4 Dimensions.



Note:

1. Unit must be installed in compliance with the installation manual.
2. Unit must be grounded in accordance with the local regulations or applicable national codes.
3. The Unit is powered from the outdoor unit. Therefore power cable should be connected with the outdoor unit.

Item No.	Part Name	Remark
1	Front Panel	
2	Display & Signal Receiver	
3	Air Suction Grille	
4	Installation Plate	

## Refrigerant Flow Diagram

SF Frame

Figure 8: SF Frame Piping Diagram.

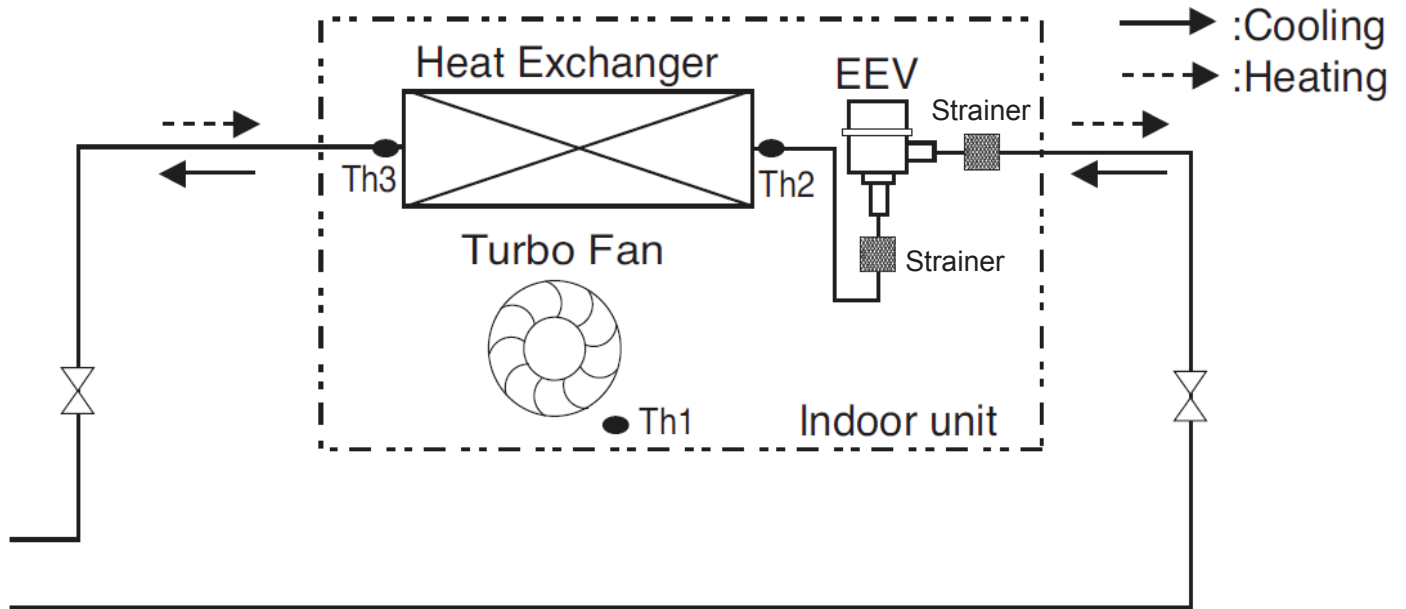


Table 9: SF Frame Refrigerant Pipe Connection Port Diameters.

Model	Liquid (inch)	Vapor (inch)
<b>SF Frames</b>		
ARNU093SFA4	1/4 Flare	1/2 Flare
ARNU123SFA4	1/4 Flare	1/2 Flare

Table 10: SF Frame Thermistors.

Thermistor	Description
TH1	Return air thermistor
TH2	Pipe in thermistor
TH3	Pipe out thermistor

Multi V Wall-Mounted Indoor Unit

Figure 9: SJ, SK, and SV Frame Piping Diagram.

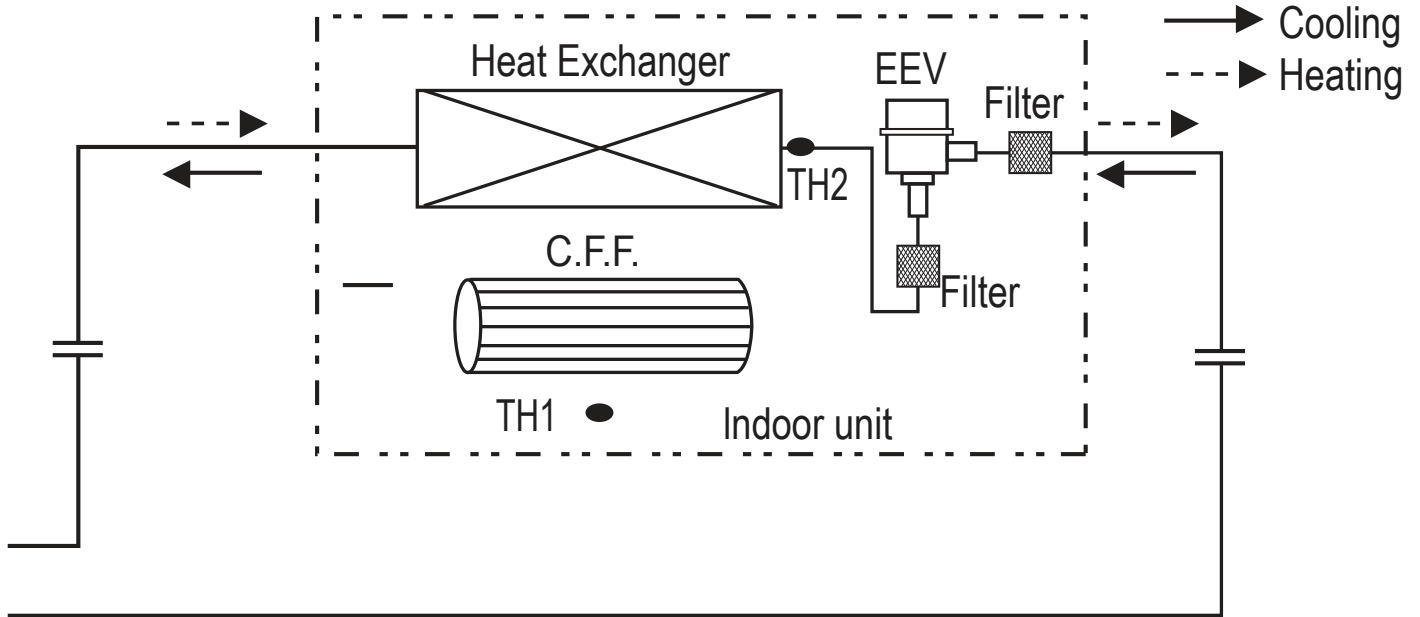


Table 11: SJ, SK, and SV Frame Refrigerant Pipe Connection Port Diameters.

Model	Liquid (inch)	Vapor (inch)
<b>SJ Frames</b>		
ARNU053SJA4	1/4 Flare	1/2 Flare
ARNU073SJA4		
ARNU093SJA4		
ARNU123SJA4		
ARNU153SJA4		
<b>SK Frames</b>		
ARNU183SKA4	1/4 Flare	1/2 Flare
ARNU243SKA4	3/8 Flare	5/8 Flare
<b>SV Frames</b>		
ARNU303SVA4	3/8 Flare	5/8 Flare
ARNU363SVA4		

Table 12: SJ, SK, and SV Frame Thermistors.

Thermistor	Description
TH1	Return air and pipe in thermistor
TH2	Pipe out thermistor

# ART COOL™ MIRROR



## Refrigerant Flow Diagram

SJ and SK Frames

Figure 10: SJ, SK Frame Piping Diagram.

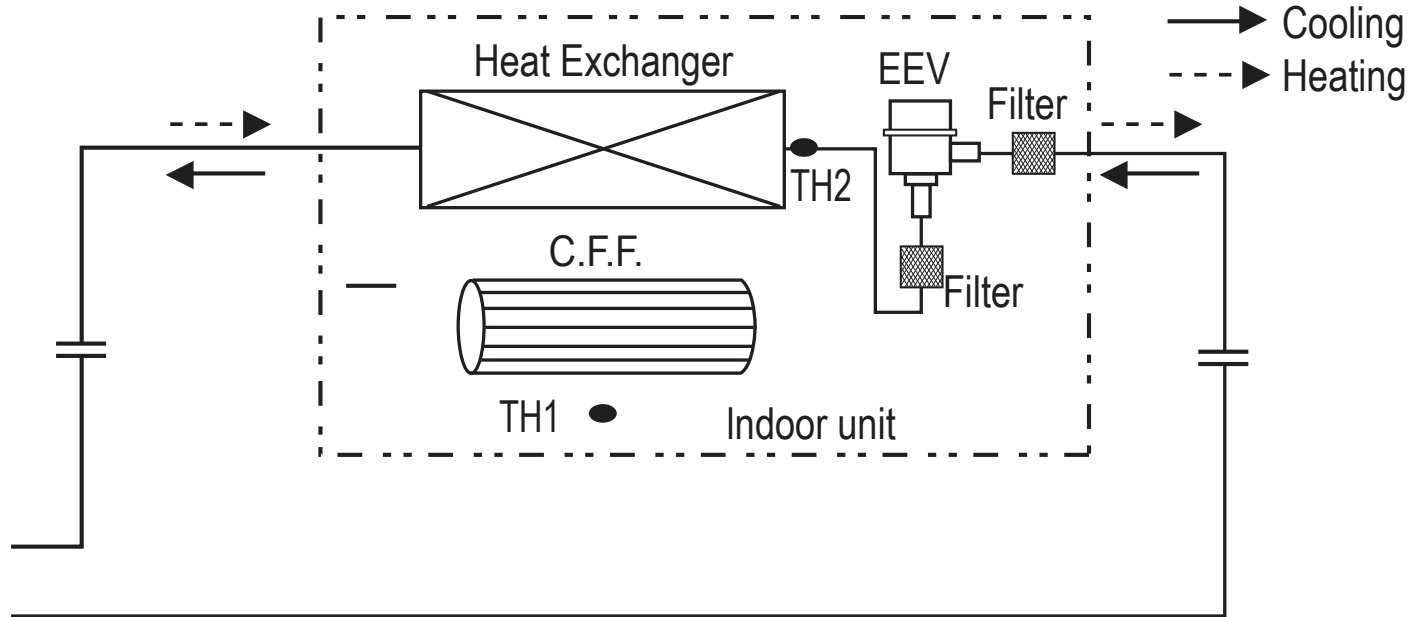


Table 13: SJ, SK Frame Refrigerant Pipe Connection Port Diameters.

Model	Liquid (inch)	Vapor (inch)
<b>SJ Frames</b>		
ARNU053SJR4	1/4 Flare	1/2 Flare
ARNU073SJR4		
ARNU093SJR4		
ARNU123SJR4		
ARNU153SJR4		
<b>SK Frames</b>		
ARNU183SKR4	1/4 Flare	1/2 Flare
ARNU243SKR4	3/8 Flare	5/8 Flare

Table 14: SJ, SK Frame Thermistors.


Thermistor	Description
TH1	Return air and pipe in thermistor
TH2	Pipe out thermistor

Multi V Wall-Mounted Indoor Unit

**Note:**

Follow recommended best practices when choosing a location for the Gallery and Wall-Mounted Indoor Units (IDU).










**⚠ DANGER**

To avoid the possibility of fire,  do not install the unit in an area where combustible gas may 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.

**Dos**

- Ensure that the wall is solid and has enough structural strength to bear the weight of the installation plate (if applicable) and indoor unit.
- Include enough space for service access.
- Include space for drainage to ensure condensate flows properly out of and away from the unit when it is in cooling mode.
- 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.
- Install the indoor unit in a location where it can be easily connected to the outdoor unit / heat recovery unit.

** Dont's**

-  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.
-  Ensure there are no obstacles to air circulation around the unit; keep proper distances from ceilings, doorways, floor, walls, etc.
-  Do not install in an area where operation sound will disturb occupants--place the unit where noise prevention is taken into consideration.
-  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 may generate condensate, cause a reduction in heat exchanger efficiency, or the drain to malfunction. If this is a potential problem, install a ventilation fan large enough to vent out these materials.)

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

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

- Verify that carpet is or will be installed (carpet may increase the temperature by three [3] degrees).
- Add insulation between the floor joists.
- Install radiant heat or another type of heating system to the floor.

## Required Clearances

### **⚠ WARNING**

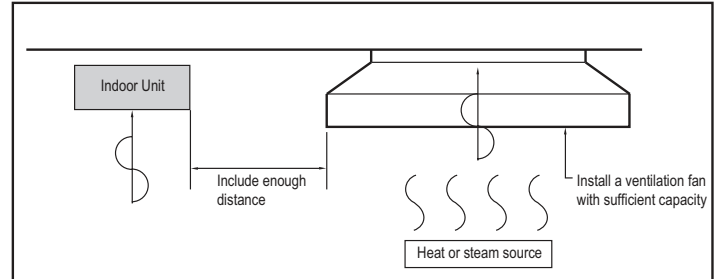
The unit must not be installed where sulfuric acid and flammable or corrosive gases are generated, vented into, or stored. There is risk of fire, explosion, and physical injury or death.

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

#### **Note:**

- Indoor units (IDUs) must not be placed in an environment where the IDUs may 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.

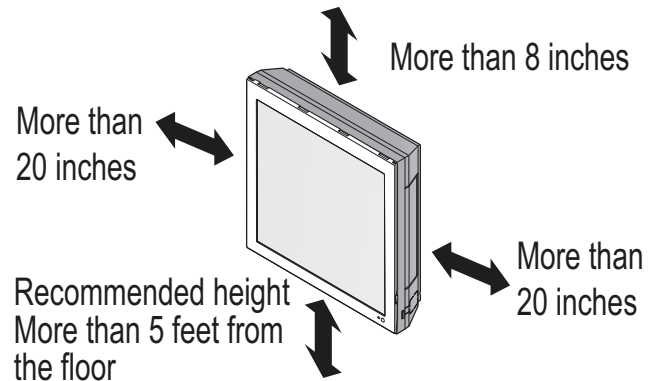
Figure 11: Installing Near a Heat or Steam Source.



### Required Clearances for Gallery Indoor Unit

See the figure on the right for required clearance distances around a typical installed Gallery indoor unit.

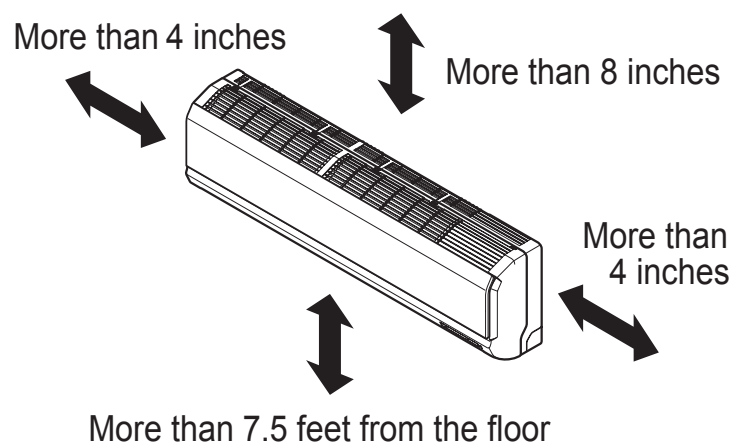
Figure 12: Required Clearances Around Installed Gallery Unit



### Required Clearances for Wall Mounted Indoor Unit

See the figure on the right for required clearance distances around a typical installed wall-mounted indoor unit.

Figure 13: Required Clearances Around Installed Wall-Mounted Unit



#### **Do's**

- There must be a minimum clearance of 8 inches from the top of the indoor unit to the ceiling.
- Clearance gap between any wall or enclosure and the left or right side of the unit must be greater than 4 inches. Ensure there is sufficient maintenance space.
- Unit must be at least 7.5 feet from the floor for adequate clearance.



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## Unpack and Inspect for Freight Damage

### ⚠ CAUTION

To help avoid injury to personnel and damage to the unit, use at least two people when carrying a unit by hand.

#### Note:

Shipping and net weights of the Gallery and wall-mounted indoor units are listed in the General Data section.

⊘ Do not unpack the unit and remove the protective materials until ready to install. Before unpacking, carefully move the packaged unit to a work area near the installation location.

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 adjuster to inspect. Call your supervisor on how to proceed with filing a freight claim and to order a replacement unit.

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 Wall-Mounted Indoor Units Nomenclature in the General Data section.

1. Before opening the shipping container, verify you have the correct unit.
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 factory-supplied parts, etc.
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 chassis only. If damage is found, repack the unit as it was received in the original container.
11. If the unit is undamaged, remove and retain the installation manual.

## Gallery Indoor Units

SF Frame

### General Guidelines — Gallery Indoor Units

Gallery indoor units have two options on how the piping and wiring can be routed: rear left or right.

#### ⚠ WARNING

- When choosing a location for the Gallery unit, be sure to 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.
- Screws and anchors must be securely installed to prevent the chassis falling from its installation location. There is risk of injury from falling equipment.

#### Note:

- Select the location carefully. Unit must be anchored to a strong wall to prevent unnecessary vibration.
- Mounting hardware must be securely installed to prevent the chassis falling from its installation location. There is risk of property damage from falling equipment.
- 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 Gallery chassis is 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.

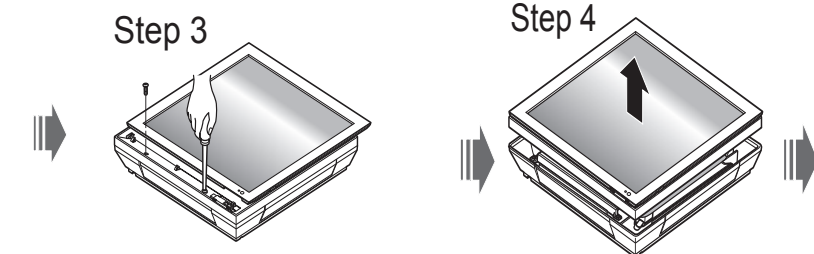
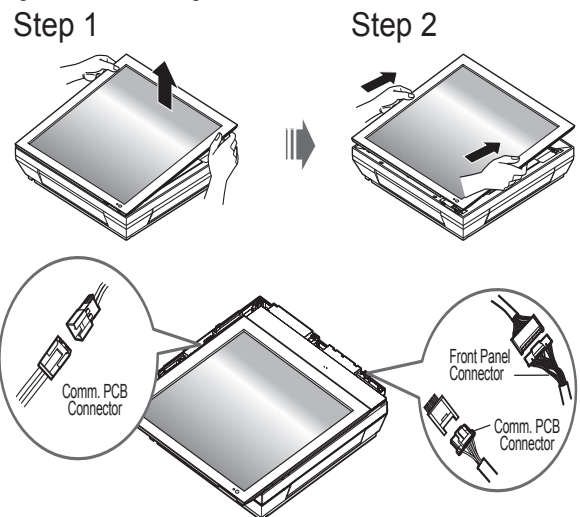
### Preparing for Installation — Gallery Indoor Units

#### Detaching the Picture and Front Metal Panels

Before mounting the indoor unit to the wall, the front cover must be removed. Removal will allow the side holes to be knocked out, as well as mounting the unit without damaging the front cover.

1. Lay the indoor unit on a flat surface, and then pull the upper part of the picture panel away from the chassis (Step 1).
2. Lift up the picture panel so that the bottom part of the unit is visible (Step 2).
3. Detach the front metal cover by removing the two screws located at the bottom (Step 3).
4. Disconnect the front metal panel connector at the top of the unit, then disconnect the Front Panel and Communication PCB connectors (Step 4).

Figure 14: Detaching the Front Panel.



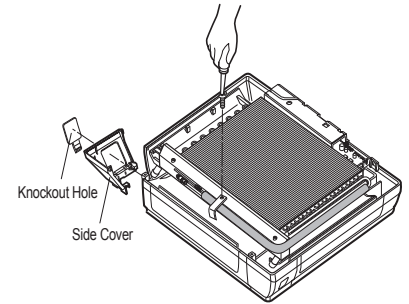
### Preparing for Installation — Gallery Indoor Units, continued.

#### Removing Side Bottom Covers and Piping Knockout from the Gallery Indoor Unit

Figure 15: Removing Covers and Knockout Hole.

Before mounting the indoor unit, either the right or left bottom side covers and the piping hole knockout need to be removed to pass the drain hose and piping through. This procedure must be done after removing the indoor unit front metal panel.

1. Using a Phillips head screwdriver, remove the center bottom screw from the L-bracket tube holder.
2. Detach one of the side covers (either right or left depending on how the piping and drain hose need to be routed).
3. Knockout the piping hole from the detached side cover.



#### **CAUTION**

After knocking out the hole from the side cover, be sure to smooth or cut any burrs around the hole. Burrs can lead to physical cuts and scrapes.

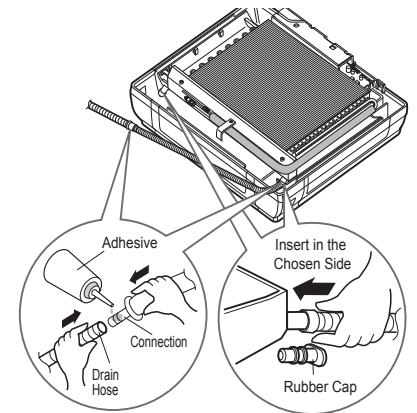
#### **Note:**

- If the application calls for creating a piping hole directly through the rear wall, the knockout the piping hole from the side cover might not be necessary.
- It is recommended that the picture and front metal panels not be re-attached to the indoor unit until the final test has been run which will ensure that all electrical and piping connections are working properly.

#### Preparing the Drain Hose Connection

1. To prepare indoor unit for the drain hose, remove the rubber plug at the desired direction (left or right at bottom of the unit). Ensure that the drain hose is routed to the closest pipe hole under the unit.
2. Insert the drain hose into the opening / handle of the drain pan, and then attach the drain hose and connecting hose using recommended adhesive. This step can be done once the indoor unit is mounted to the wall if necessary.

Figure 16: Connecting the Drain Hose.



## Gallery Indoor Units

SF Frame

### Mounting — Gallery Indoor Units

**Note:**

Select the location carefully. Unit must be anchored to a strong wall to prevent unnecessary vibration.

**⚠ WARNING**

- When choosing a location for the indoor unit, be sure to 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.

1. Align and level the factory-supplied installation guide onto the wall. Lightly attach the guide to the wall with tape (Steps 1 and 2).
2. At the cross marks on the installation guide, drill four (4) 1/4 inch holes that are approximately 1-1/8 to 1-7/16 inches deep (Step 3).
3. Choose rear left or right routing for the refrigerant / drain connection piping, and, using the installation guide, drill a two (2) inch diameter hole at the appropriate location (Step 4).
4. Drive the four (4) plastic anchors into each of the drilled holes (Step 5).
5. Insert screws into the top left and right of the installation guide, leaving about 7/16 inches of the screw out of the wall to hang the Gallery indoor unit (Step 6).
6. Hang the Gallery indoor unit on the top left and right screws, using the hanger holes on the back of the unit. Remove the installation guide (Step 7).
7. After the top of the Gallery unit is secure, attach the bottom with the remaining two (2) screws (Step 8). Tighten all screws.
8. After the unit is anchored, test the installation by gently applying downward pressure with both hands and jiggling to be sure it is attached securely (Step 9).
9. If the Gallery indoor unit is loose, repeat the steps above and adjust the screws as necessary. If the Gallery unit is secure, then procedure with connecting the piping and wiring.

Figure 17: Mounting the Gallery Indoor Unit

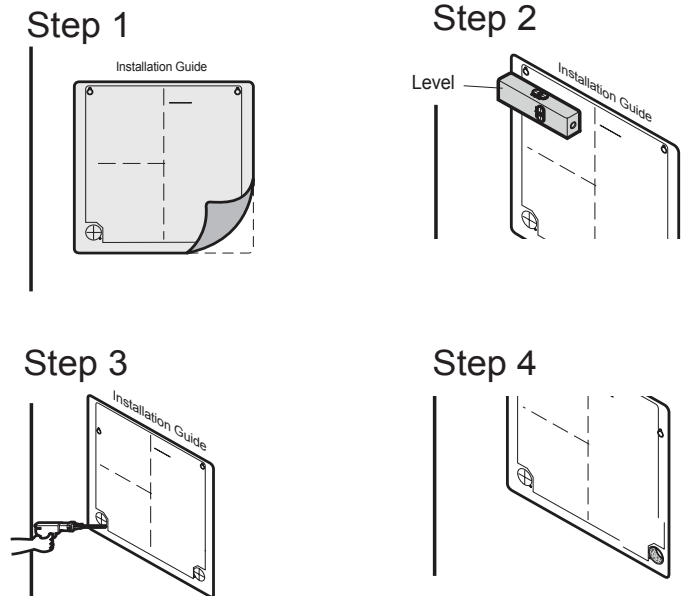
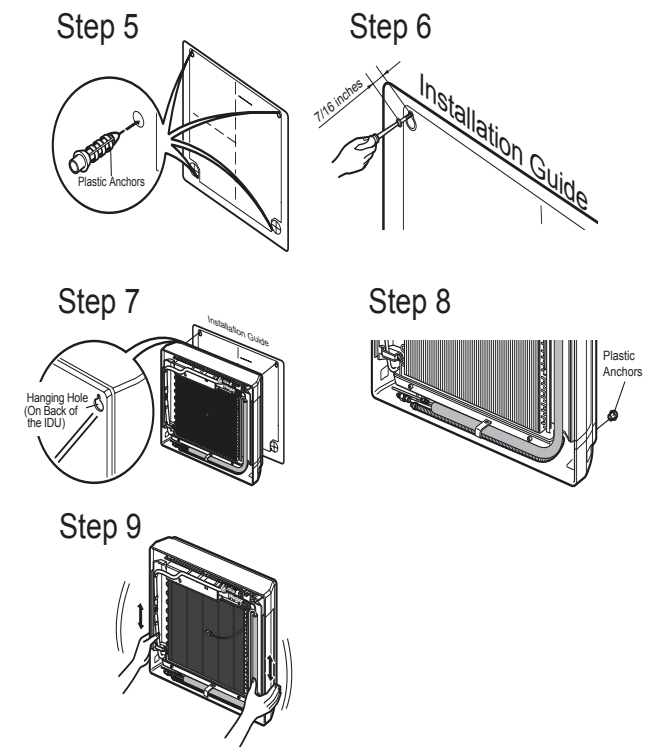


Figure 18: Gallery Install, continued



Multi V Wall-Mounted Indoor Unit

### General Guidelines — 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

#### **⚠ WARNING**

Use caution when drilling holes through walls. Drilling into power wiring in the wall can cause serious bodily injury or death.

Follow the left or right piping clearance recommendations.

1. Using a 2-5/8 (ø65mm) inch hole core drill bit, drill a hole at either the right or left side of the wall mounting. The hole must slant 3/16” to 5/16” from level (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. Sleeve and bushing prevents damage to the tubing / bundling of the piping.

Figure 19: Choice of Piping / Wiring Routes.

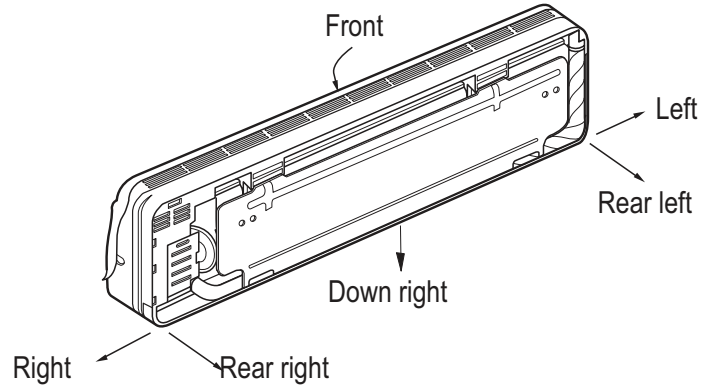
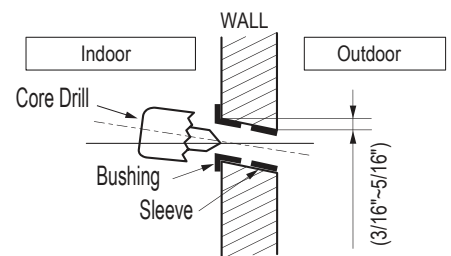


Figure 20: Drilling the Piping Hole.



## Wall Mounted Indoor Units

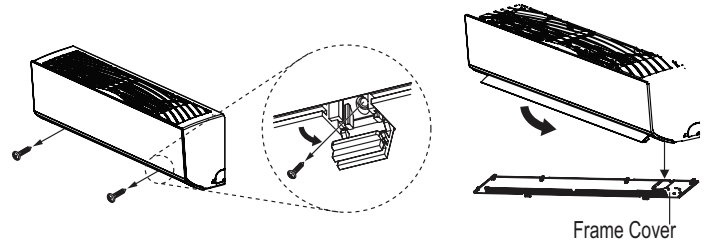
### SV Frame

### Preparing for Installation — Wall-Mounted Indoor Units (SV Frame)

To avoid piping damage when moving the piping away from the indoor unit chassis, follow instructions below.

1. Remove the screw covers at the bottom of the indoor unit and unscrew the two Type B screws. Remove the chassis cover (may differ depending on indoor unit type).
2. Unlock the tubing clamp (clamps may differ depending on indoor unit type).

Figure 21: Removing the Chassis Cover.



### Mounting the Installation Plate — Wall-Mounted Indoor Units (SV Frame)

The mounting wall must be strong and solid enough to protect the unit from vibration. It must securely hold the installation plate and the weight of the chassis.

1. Before installation of the plate, confirm the position the screw types (A or B) between chassis and installation plate.
2. Mount the installation plate horizontally by aligning the center line using a leveling tool, and use the factory-provided screws. If mounting the unit on concrete, consider using anchor bolts. Use a level to ensure the plate is level.
3. Choose what side (left or right) to install the piping, and then observe the left and right rear piping clearances when drilling into the wall.

Figure 22: Standard Wall-Mounted (SV Frame) Installation Plates.

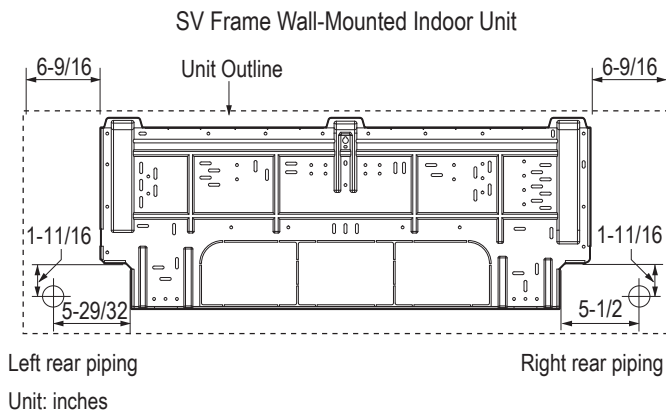
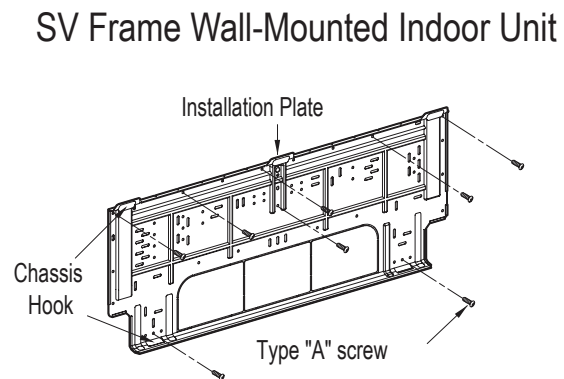


Figure 23: Standard Wall-Mounted (SV Frame) Installation Plates. Attaching Screw Placement.





## Mounting the Installation Plate to the Wall

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.
2. Align the center line using a leveling tool. Measure the wall and mark the center line.
3. Attach the installation plate to the wall following the measurements and marks. Use the type "A" screws that are factory-supplied with the plate. If mounting the unit on a concrete wall, use field-supplied anchor bolts.
4. Observe all rear piping clearances when drilling into the wall.

**⚠ WARNING**

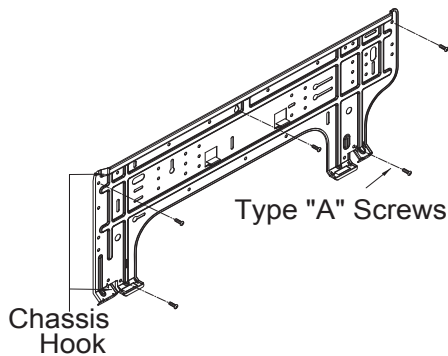
- When choosing a location for the wall mount plate, be sure to take into consideration routing of wiring for power outlets within the wall. Contacting wiring can cause serious bodily injury or death.
- Use caution when drilling holes through the walls for the purposes of piping connections. Power wiring can cause serious bodily injury or death.

**Note:**

Select the location carefully. Unit must be anchored to a strong and solid wall to prevent unnecessary vibration.

Figure 24: Wall Mount Indoor Unit Installation Plates.

**SJ Frame Installation Plate**



**SK Frame Installation Plate**

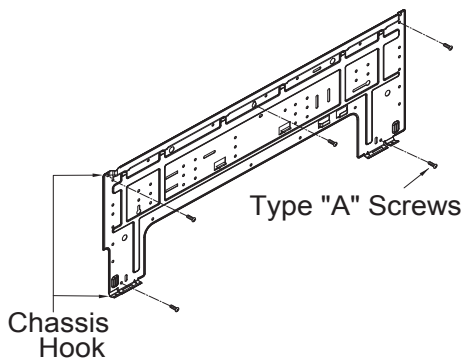
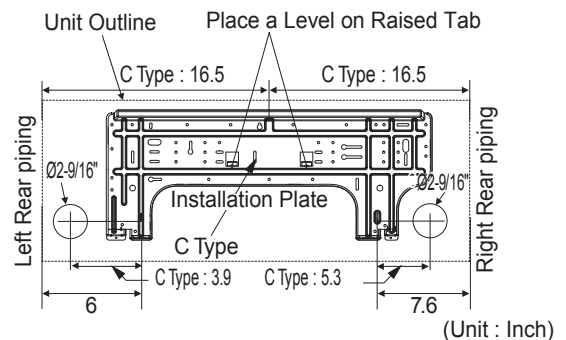
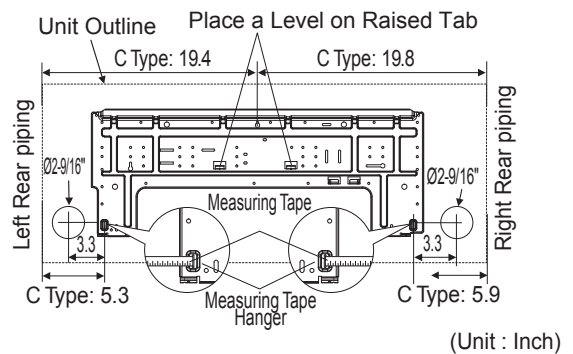


Figure 25: Wall Mount Indoor Unit Installation Plate Dimensions.

**SJ Frame Installation Plate**



**SK Frame Installation Plate**




# REFRIGERANT PIPING



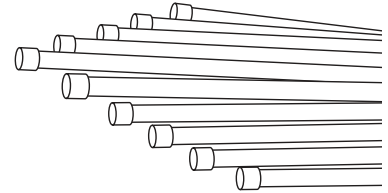
## Piping Handling

### Piping Materials and Handling

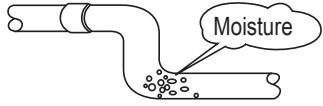
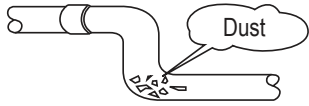
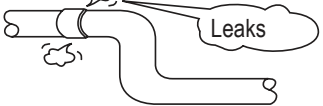

Pipes used for the refrigerant piping system must include the specified thickness, and the interior must be clean.

While handling and storing,  do not bend or damage the pipes, and take care not to contaminate the interior with dust, moisture, etc.

Keep Pipes Capped While Storing.



Keep refrigerant pipe dry, clean, and airtight.

	Dry	Clean	Airtight
	No moisture inside piping. 	No dust inside piping. 	No leaks must occur. 
<b>Possible Problems</b>	<ul style="list-style-type: none"> <li>- Significant hydrolysis of refrigerant oil.</li> <li>- Refrigerant oil degradation.</li> <li>- Poor insulation of the compressor.</li> <li>- System does not operate properly.</li> <li>- EEVs, capillary tubes are clogged.</li> </ul>	<ul style="list-style-type: none"> <li>- Refrigerant oil degradation.</li> <li>- Poor insulation of the compressor.</li> <li>- System does not operate properly.</li> <li>- EEVs and capillary tubes become clogged.</li> </ul>	<ul style="list-style-type: none"> <li>- Refrigerant gas leaks / shortages.</li> <li>- Refrigerant oil degradation.</li> <li>- Poor insulation of the compressor.</li> <li>- System does not operate properly.</li> </ul>
<b>Solutions</b>	<ul style="list-style-type: none"> <li>- Remove moisture from the piping.</li> <li>- Piping ends must remain capped until connections are complete.</li> <li>-  Do not install piping on a rainy day.</li> <li>- Connect piping properly at the unit's side.</li> <li>- Remove caps only after the piping is cut, the burrs are removed, and after passing the piping through the walls.</li> <li>- Evacuate system to a minimum of 500 microns and insure the vacuum holds at that level for 24 hours.</li> </ul>	<ul style="list-style-type: none"> <li>- Remove dust from the piping.</li> <li>- Piping ends must remain capped until connections are complete.</li> <li>- Connect piping properly at the side of the unit.</li> <li>- Remove caps only after the piping is cut and burrs are removed.</li> <li>- Retain the cap on the piping when passing it through walls, etc.</li> </ul>	<ul style="list-style-type: none"> <li>- Test system for air tightness.</li> <li>- Perform brazing procedures that comply with all applicable standards.</li> <li>- Perform flaring procedures that comply with all applicable standards.</li> <li>- Perform flanging procedures that comply with all applicable standards.</li> <li>- Ensure that refrigerant lines are pressure tested to 550 psig and hold for 24 hours.</li> </ul>

Multi V Wall-Mounted Indoor Unit



### Pipe Supports

A properly installed pipe system must be adequately supported to avoid pipe sagging. Sagging pipes become oil traps that lead to equipment malfunction.

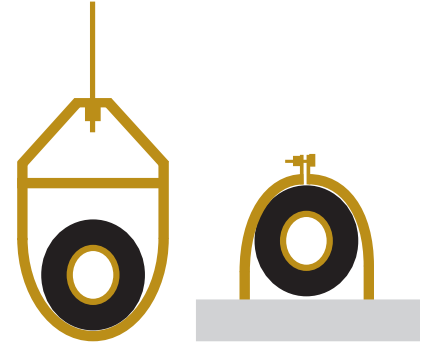
Pipe supports must never touch the pipe wall; supports must be installed outside (around) the primary pipe insulation jacket. Insulate the pipe first because pipe supports must be installed outside (around) the primary pipe insulation jacket. Clevis hangers must be used with shields between the hangers and insulation. Field provided pipe supports must be designed to meet local codes. If allowed by code, use fiber straps or split-ring hangers suspended from the ceiling on all-thread rods (fiber straps or split ring hangers can be used as long as they do not compress the pipe insulation). Place a second layer of insulation over the pipe insulation jacket to prevent chafing and compression of the primary insulation in the confines of the support clamp.

A properly installed pipe system will have sufficient supports to avoid pipes from sagging during the life of the system. As necessary, place supports closer for segments where potential sagging could occur. Maximum spacing of pipe supports must meet local codes. If local codes do not specify pipe support spacing, the pipe must be supported in the following way:

- Maximum of five (5) feet on center for straight segments of pipe up to 3/4 inches outside diameter size.
- Maximum of six (6) feet on center for pipe up to one (1) inch outside diameter size.
- Maximum of eight (8) feet on center for pipe up to two (2) inches outside diameter size.

Wherever the pipe changes direction, place a hanger within twelve (12) inches on one side and within twelve (12) to nineteen (19) inches of the bend on the other side. Support piping at indoor units, Y-branch, and Header fittings as shown.

Figure 26: Pipe Hanger Details.



**Note:**

Use a 4" + long sheet curved sheet metal saddles between hanger bracket and insulation to promote linear expansion/contraction.

Figure 27: Typical Pipe Support Location—Change in Pipe Direction.

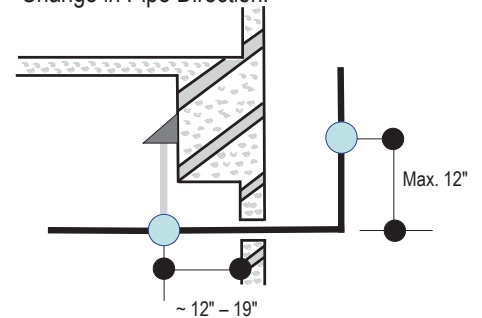


Figure 28: Pipe Support at Indoor Unit.

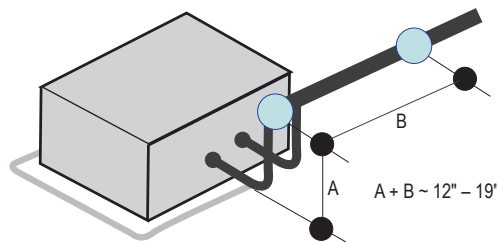


Figure 29: Pipe Support at Y-branch Fitting.

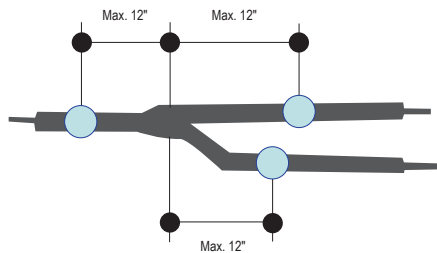
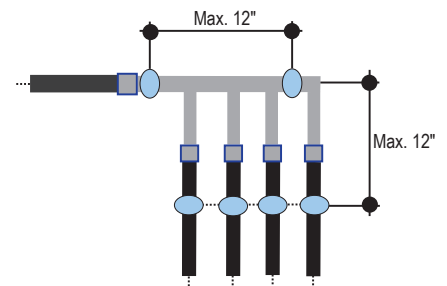


Figure 30: Pipe Support at Header Fitting.



## Piping Preparation

### Flaring and Brazing Procedures

One of the main causes of refrigerant leaks is a defective connection. For VRF systems, the installer needs to know how to perform both flared and brazed 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.

### 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. Remove the flare nuts attached to the indoor and outdoor units. Slide the flare nut onto the copper tube.

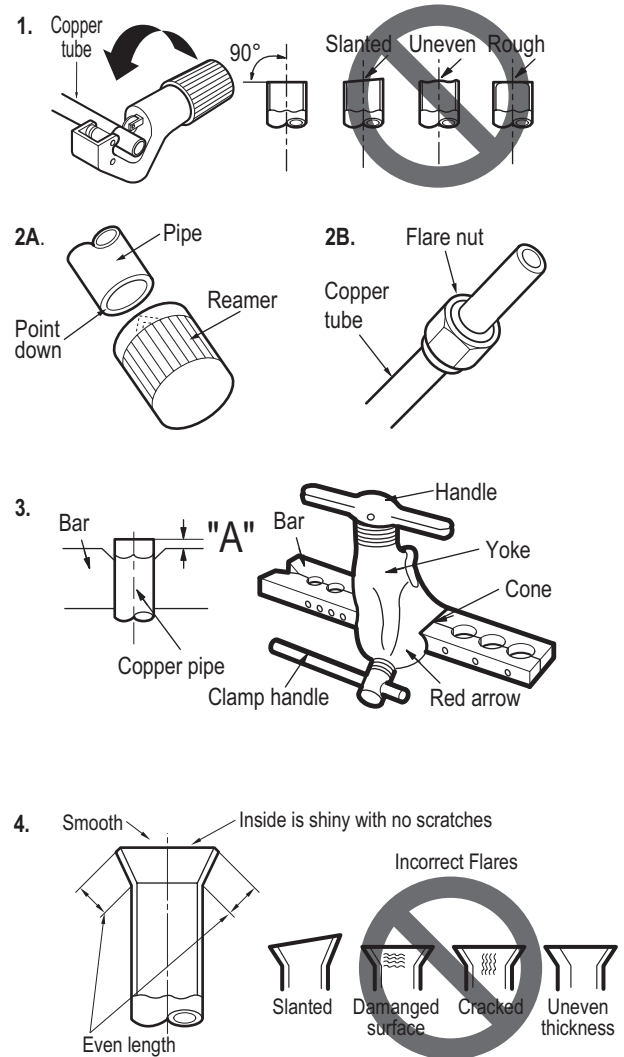
#### 3. Flaring the pipe end.

- Use the proper size flaring tool to finish flared connections as shown.
- ALWAYS create a 45° flare when working with R410A.
- Firmly hold copper tube in a bar with a dimension as indicated in the table below.

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

- Compare the geometry with the figures and dimensions as detailed.
- If the flare is defective, cut it off and re-do procedure.
- If flare looks good, blow the pipe clean with dry nitrogen.

Figure 31: Flaring procedure.



Multi V Wall-Mounted Indoor Unit

**Flaring Procedure, continued.**

Figure 32: Flaring procedure.

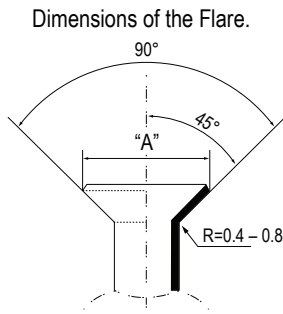


Table 16: Flared Connection Dimensions / Tightening Torque.

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 Connections**

Table 15: 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.

### Brazing Procedure

#### ⚠ WARNING

⊘ Do not braze in an enclosed location. ⊘ Do not allow the refrigerant to leak during brazing. Always test for gas leaks before and after brazing.

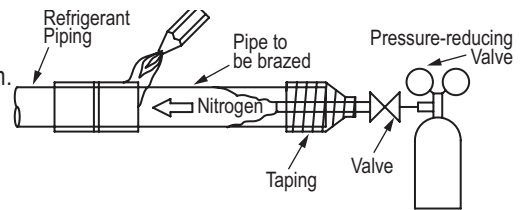
*If the refrigerant combusts, it generates a toxic gas that may cause physical injury or death.*

#### Note:

*Braze the pipes to the service valve pipe stub of the outdoor unit.*

1. All joints are brazed in the field. Multi V refrigeration system components contain very small capillary tubes, small orifices, electronic expansion valves, oil separators, and heat exchangers that can easily become blocked. Proper system operation depends on the installer using best practices and utmost care while assembling the piping system.
2. Store pipe stock in a dry place; keep stored pipe capped and clean.
3. Blow clean all pipe sections with dry nitrogen prior to assembly.
4. Use adapters to assemble different sizes of pipe.
5. Always use a non-oxidizing material for brazing. ⊘ Do not use flux, soft solder, or anti-oxidant agents. If the proper material is not used, oxidized film may accumulate and clog or damage the compressors. Flux can harm the copper piping or refrigerant oil.
6. Use a tubing cutter, ⊘ do not use a saw to cut pipe. De-bur and clean all cuts before assembly.
7. Brazing joints:
  - Use a dry nitrogen purge operating at a minimum pressure of three (3) psig and maintain a steady flow.
  - Use a 15% silver phosphorous copper brazing alloy to avoid overheating and produce good flow.
  - Protect isolation valves, electronic expansion valves, and other heat-sensitive control components from excessive heat with a wet rag or heat barrier spray.

Figure 33: Refrigerant Pipe Brazing.



#### ⚠ WARNING

- ⊘ Do not allow the refrigerant to leak during brazing; if the refrigerant combusts, it generates a toxic gas. There is risk of fire, explosion, and physical injury or death.
- ⊘ Do not braze in an enclosed location, and always test for gas leaks before / after brazing. There is risk of fire, explosion, and physical injury or death.

### Refrigerant Pipe Connections

Indoor units come with flare type connections. It is the installer's option to use the flare fittings provided or braze the indoor unit to the refrigerant piping system.

**Flare Fittings:**

- All unit flare fittings are 45° and rate for high-pressure R410A refrigerant.
- Properly form all flare fittings using best practices.
- Place a drop of PVE oil on the outside of the flare fitting before tightening.

**Note:**



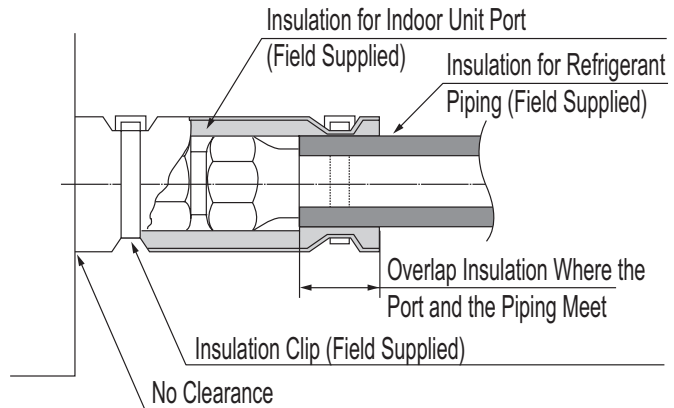
-  Do not use any other type of oil (including traditional POE refrigeration oil) as a lubricant. Failure to follow this procedure may lead to restrictions in the refrigeration components.
-  Do not over-tighten flare nuts. Excessive tightening will cause fittings to crack.
- Multi V refrigeration system components contain very small capillary tubes, small orifices, electronic expansion valves, oil separators, and heat exchangers that can easily become blocked

Figure 34: Typical Refrigerant Line Flare Fitting Insulation Detail



### Connecting the Indoor Unit Piping to the Field-Installed Piping

1. Center align the indoor unit piping (refrigerant and drain) and the field-installed piping, then hand tighten the flare nut.
2. Tighten the flare nut with a torque wrench.
3. Attach the drain tube piping to the indoor unit drain hose as shown.
4. Wrap insulation material around the connection, overlapping the material and binding securely with vinyl tape so there are not gaps. (See Piping Bundling" section for instructions.)

Figure 35: Indoor Unit to Field-Installed Piping Connection.

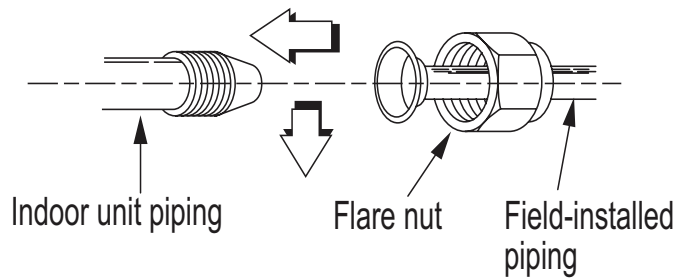
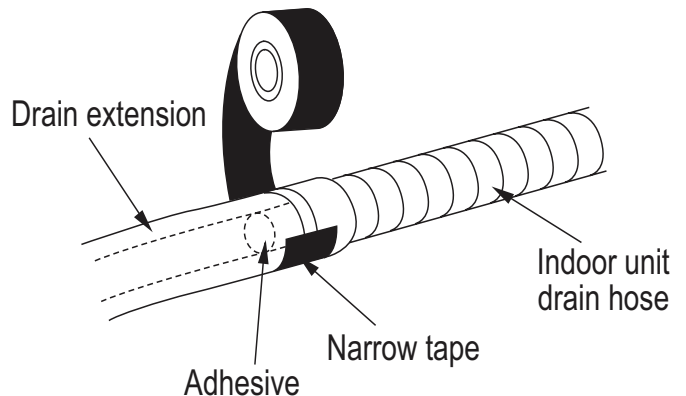


Figure 36: Extending the Drain Hose.



**Note:**

- If the drain hose is routed inside a room, add insulation to prevent condensation from forming.
- Seal up any access holes in walls or ceilings with bushing.

# PIPING INSTALL



## Gallery Indoor Units

SF Frame

### Installing the Piping — Gallery Indoor Units

The indoor unit piping must be prepared for installation through the wall. Gallery indoor units have two options on how the piping and wiring can be routed: rear left or right.

#### Installing Piping to the Left Side

1. From the rear of the indoor unit, unlock the tubing clamp. Carefully bend the piping downward.
2. Pull the field drain and refrigerant piping, and the connecting cable from the access hole in the wall.
3. Connect the indoor unit drain hose and piping to the field drain piping and refrigerant piping. (See the “Connecting the Indoor Unit Piping to Field Piping” section for instructions.)
4. Tape the drain hose, piping, and the connecting cable together, and install insulation. (See the “Piping Bundling” and “Insulating the Piping” sections for instructions.)

#### Installing Piping to the Right Side

1. From the rear of the indoor unit, press on the top of the clamp, then carefully bend the piping downward.
2. Slowly bend the piping to the right at a 90° angle.
3. Pull the field drain piping and refrigerant piping, and the connecting cable from the access hole in the wall.
4. Connect the indoor unit drain hose and piping to the field drain piping and refrigerant piping. (See the “Connecting the Indoor Unit Piping to Field Piping” section for instructions.)
5. Tape the drain hose, piping, and the connecting cable together, and install insulation. (See the “Piping Bundling” and “Insulating the Piping” sections for instructions.)

Figure 38: Piping Installation to the Right Side.

DO

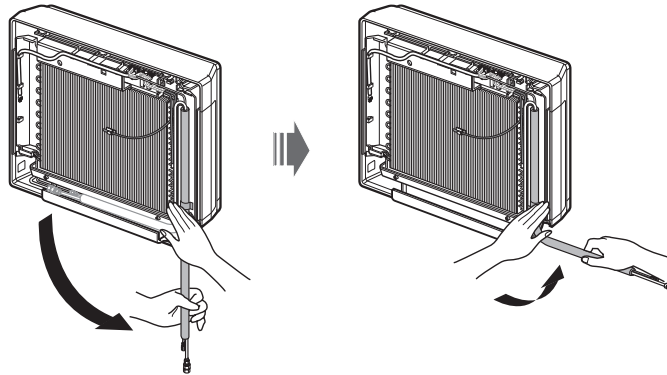


Figure 37: Piping Installation to the Left Side.

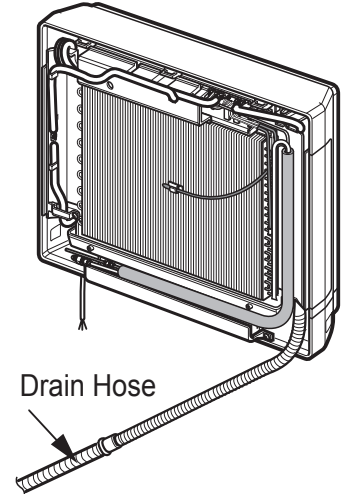
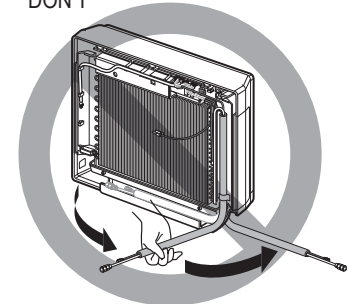




Figure 39: Incorrect Piping Bend

DON'T



#### Note:

- Bending in a violent right-to-left motion could damage the piping.
- Bending the piping directly left or right, without bending it downward first, may cause damage.
-  Do not twist the piping.
-  Do not bend the piping towards the front of the unit because this may damage the indoor unit.

**Installing the Piping — Wall-Mounted Indoor Units (SV Frame)**

1. Piping can be install straight down, straight back, to the left, or to the right. If installing the piping straight down, through the left, or through the right side of the indoor unit, remove the appropriate piping access hole on the indoor unit chassis.
2. Slowly bend the piping downward (B). Position the piping for installation (straight down, straight back, to the left, or to the right).

**Note:**

*Bending in a violent right-to-left motion could damage the piping.*

Figure 40: Exterior Back View of Indoor Unit.

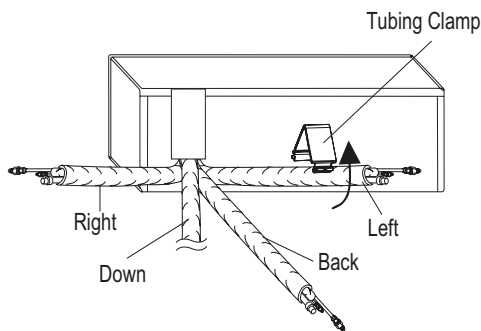
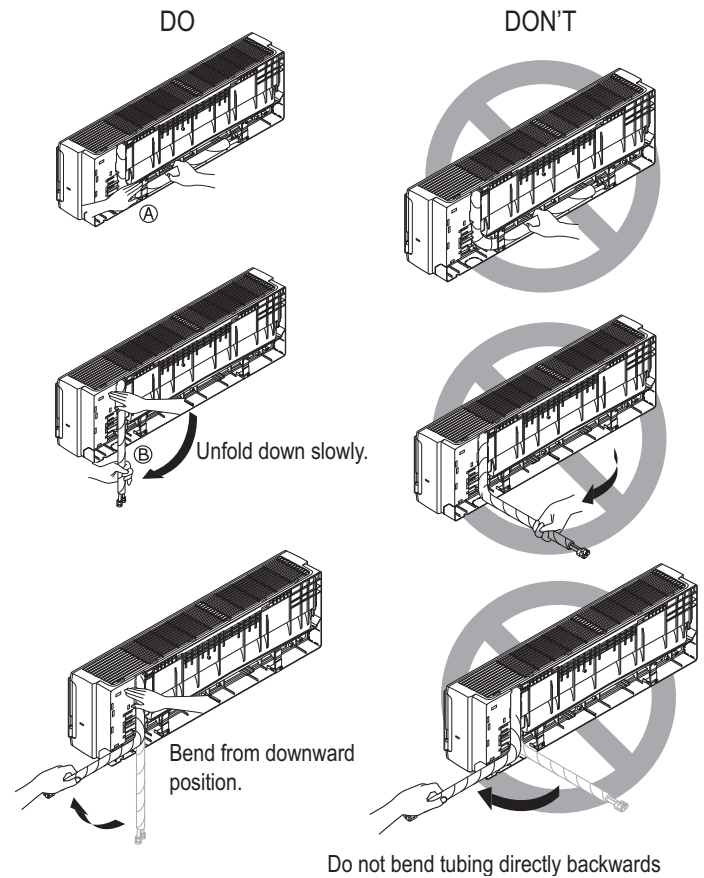


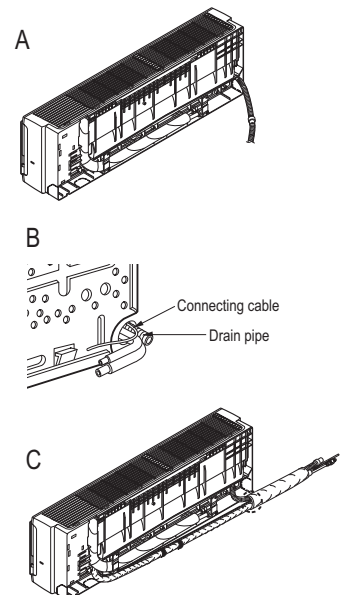
Figure 41: Dos and Don'ts of Accessing the Piping.



**Installing Piping to the Left Side (SV Frame)**

1. Unlock the tubing clamp, and route the indoor unit refrigerant piping and the drain hose to the required chassis access hole on the left side (A).
2. Pull the field drain piping and refrigerant piping, and the connecting cable from the access hole in the wall.
3. Guide the connection cable into the indoor unit, but don't attach to the terminals (B). (Make a small loop in the cable for easy connection later.)
4. Connect the indoor unit drain hose and piping to the field drain piping and refrigerant piping (C). (See the "Connecting the Indoor Unit Piping to Field Piping" section for instructions.)
5. Tape the drain hose, piping, and the connecting cable together, and install insulation (C). (See the "Piping Bundling" and "Insulating the Piping" sections for instructions.)
6. Reroute the indoor unit drain hose and refrigerant piping across the back of the indoor unit, and lock in place with the tubing clamp (C).
7. Reroute the field drain and refrigerant piping back into the wall, and, after connecting the power wiring and communication cables to the terminals on the indoor unit, hang the indoor unit.

Figure 42: Piping Installation to the Left Side.





# PIPING INSTALL

## Wall Mounted Indoor Units

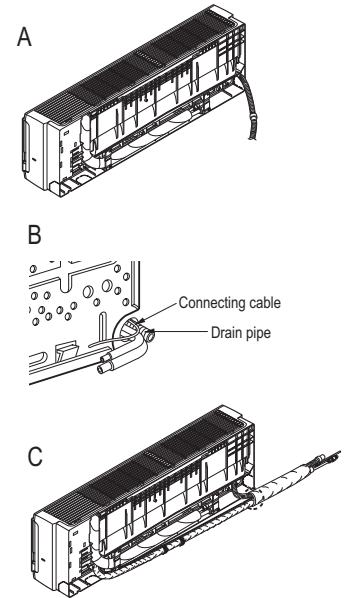
### SV Frame



#### Installing Piping to the Left Side (SV Frame)

1. Unlock the tubing clamp, and route the indoor unit refrigerant piping and the drain hose to the required chassis access hole on the left side (A). (See "Accessing the Indoor Unit Piping" for instructions.)
2. Pull the field drain piping and refrigerant piping, and the connecting cable from the access hole in the wall.
3. Guide the connection cable into the indoor unit, but don't attach to the terminals (B). (Make a small loop in the cable for easy connection later.)
4. Connect the indoor unit drain hose and piping to the field drain piping and refrigerant piping (C). (See the "Connecting the Indoor Unit Piping to Field Piping" section for instructions.)
5. Tape the drain hose, piping, and the connecting cable together, and install insulation (C). (See the "Piping Bundling" and "Insulating the Piping" sections for instructions.)
6. Reroute the indoor unit drain hose and refrigerant piping across the back of the indoor unit, and lock in place with the tubing clamp (C).
7. Reroute the field drain and refrigerant piping back into the wall, and, after connecting the power wiring and communication cables to the terminals on the indoor unit, hang the indoor unit.

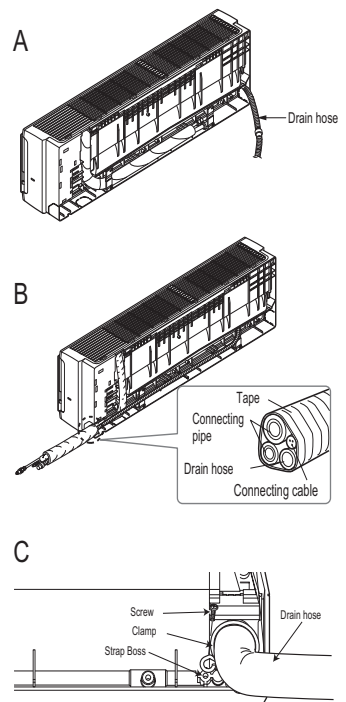
Figure 43: Piping Installation to the Left Side.



#### Installing Piping to the Right Side (SV Frame)

1. Unlock the tubing clamp, and route the indoor unit refrigerant piping and drain hose to the required chassis access hole on the right side (A).
2. Pull the field drain and refrigerant piping, and the connecting cable from the access hole in the wall.
3. Guide the connection cable into the indoor unit, but don't attach to the terminals. (Make a small loop in the cable for easy connection later.)
4. Connect the indoor unit drain hose and piping to the field drain piping and refrigerant piping (B). (See the "Connecting the Indoor Unit Piping to Field Piping" section for instructions.)
5. Tape the drain hose, piping, and the connecting cable together, and install insulation (B). (See the "Piping Bundling" and "Insulating the Piping" sections for instructions.)
6. Optional: Secure a clamp to the strap boss with a screw (C).
7. Reroute the field drain and refrigerant piping back into the wall, and, after connecting the power wiring and communication cables to the terminals on the indoor unit, hang the indoor unit.

Figure 44: Piping Installation to the Right Side.





**Removing the Indoor Unit Bottom Cover (SJ/SK Frame)**

To access the indoor unit piping port connections, 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 45: Removing the Bottom Cover.

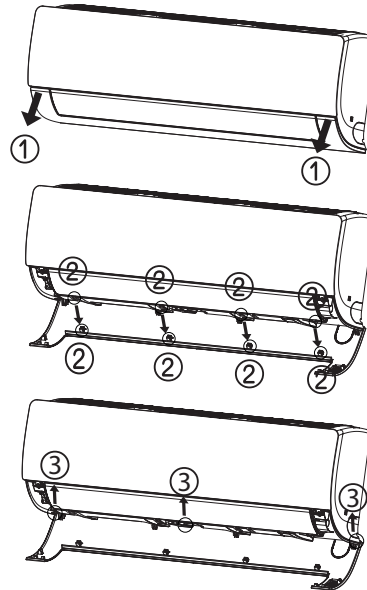


Figure 46: Removing the Bottom Cover, Alternate View.



**Preparing for Piping / Electrical Connections**

1. Unsnap the piping / drain hose holder (L-bracket) out from the indoor unit chassis. Prop it open between the indoor unit chassis and installation plate to separate the bottom of the indoor unit from the wall. This will allow for more working space.

Figure 47: Propping Open the Piping / Drain Hose Holder (L-bracket).

Figure 49: L-bracket Open.

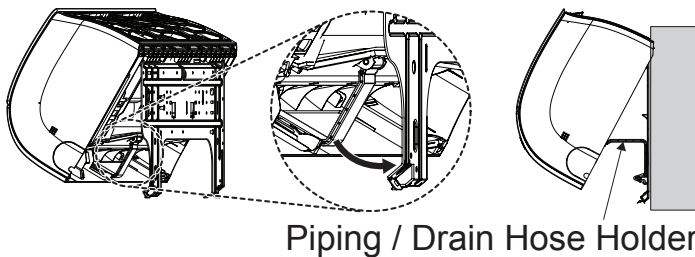
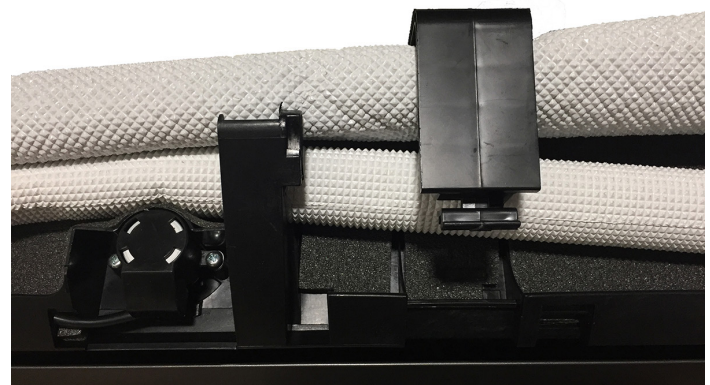
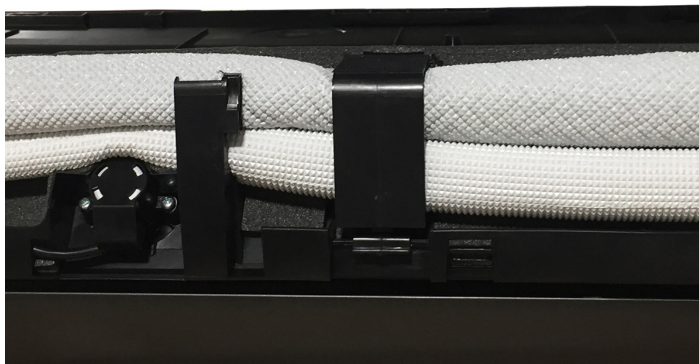


Figure 48: L-bracket Closed.



**Note:**

*Appearances may vary depending on Indoor Unit Model.*



# PIPING INSTALL

## Wall Mounted Indoor Units

SJ/SK Frame

### Preparing for Piping / Electrical Connections, continued.

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 (pre-chosen following installation guidelines and application needs) as shown. Secure piping with the piping holder.

Figure 50: Back of Indoor Unit.

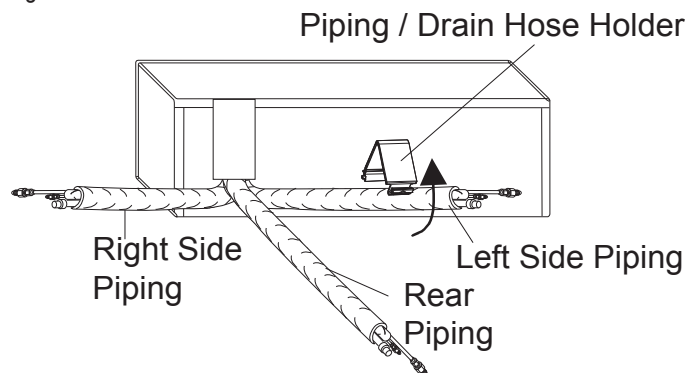
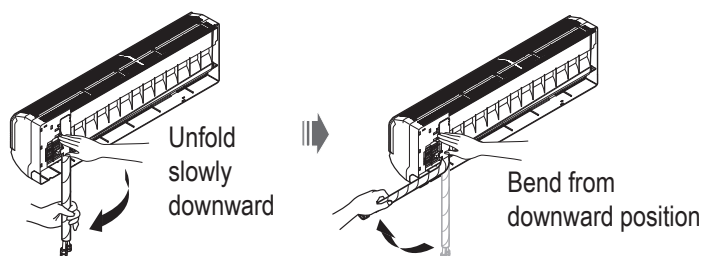


Figure 51: Bending Piping at Rear of Indoor Unit.



### Note:

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

Figure 52: Improper Piping Bending.

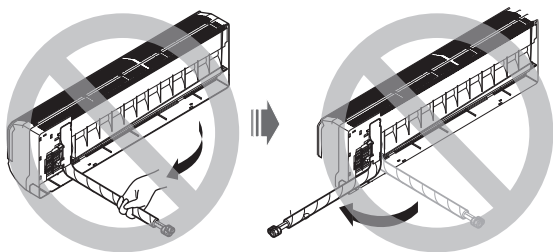
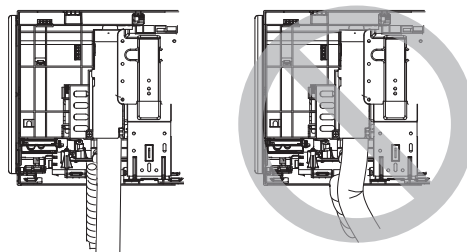


Figure 53: Keep Piping Straight; Avoid Kinks.



## 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 may 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 table on the next page.

### Note:

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

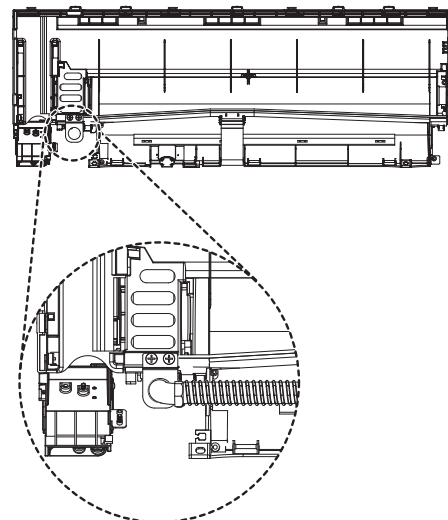
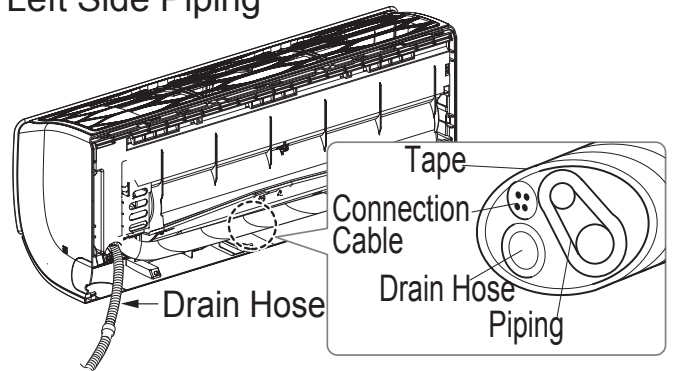
5. Bundle the refrigerant piping, drain hose, and communication / connection (power) cable together. Ensure that the drain hose is located at the bottom of the bundle.
  - If using a conduit for the power wiring / communications cable, see the next page.

### 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 54: Piping Installation When Piping is on the Left Side.

### Left Side Piping



# PIPING INSTALL



## Wall Mounted Indoor Units

SJ/SK Frame

Multi V Wall-Mounted Indoor Unit

### 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 table below.

**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.

Table 17: Torque Wrench Tightening.

Pipe Size (in. O.D.)	Outside Diameter (mm)	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

Figure 55: Piping Installation When Piping is on the Right Side.

#### Right Side Piping

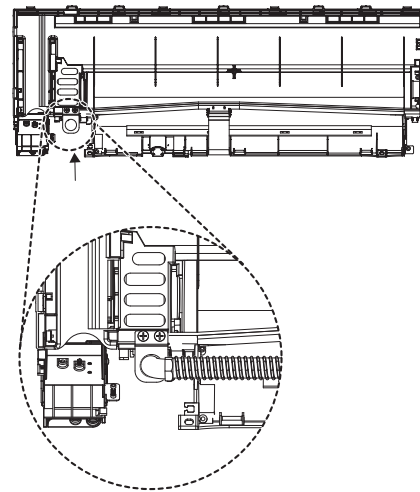
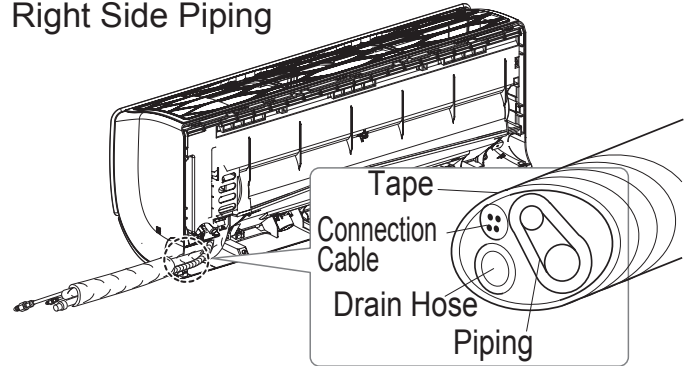
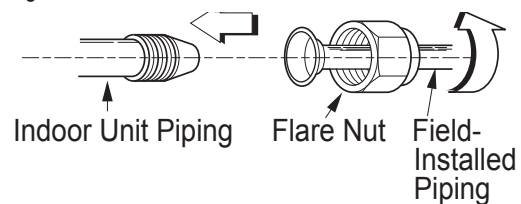


Figure 56: Indoor Unit Connection.



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

### Note:

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

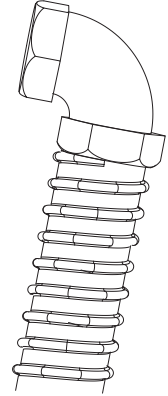
1. Prop indoor unit away from wall bracket.
2. Guide communication / connection (power) cable insulation into the conduit.

### Note:

Check local, state, and federal codes when choosing a conduit size.

3. Attach conduit using the liquid tight 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 57: Liquid tight 3/4 Inch Elbow Connector Attached to Flexible Conduit.



### Indoor Unit Condensate Drain Hose Installation

All Gallery and wall-mounted indoor units apply the gravity drain method, but a field-supplied condensate pump can be installed (optional, sold separately). Depending on the location of the indoor unit, condensation can be drained directly to the outside of the building, or a common indoor unit drainage piping system can be installed.

Gallery and wall-mounted indoor units have a built-in drain hose that can be extended. The drain hose is routed from the indoor unit through the structure (wall) to the outside or to a drainage system. Any holes through the ceilings, walls, etc., must be large enough to accommodate the drain piping and insulation.

The drain hose must slope at an angle where it is higher at the indoor unit and lower toward the outside or drainage system (about 1/50 to 1/100 down slope), thereby letting gravity push any condensation down and out.

When the bottom surface of the indoor unit is at an elevation below the receiving building drain line connection, install an inverted trap at the top of the condensate pump discharge riser before connection to the building drain pipe.

When the receiving drain line is mounted horizontal, connect the inverted trap to the top half of the pipe. The connection point of the inverted trap to the building drain pipe must always be to the top half of the pipe and must never be over 45° either side of the upper most point of the horizontal building drain line.

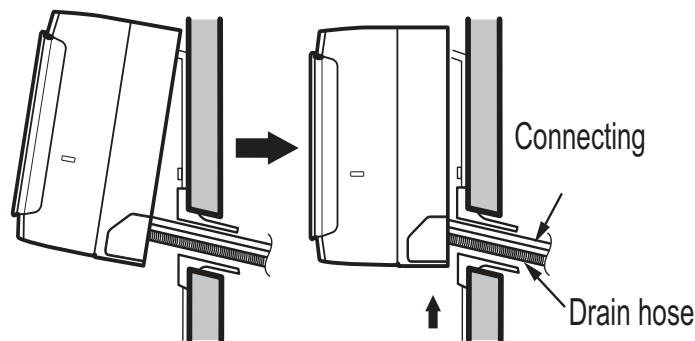
If connecting to a vertical drain line or plumbing system vent line, connect the IDU condensate pump discharge line using a Y-45 fitting with the double end of the Y-45 fitting facing up. When connecting to a vertical drain line, include an inverted trap at the top of the IDU condensate pump discharge riser before connection to the Y-45 fitting.

**Note:**

- ⊗ When making condensate pipe connections, be careful not to exert lateral force on the drain nipple. Internal damage may occur.
- ⊗ Do not provide up and down slope to prevent reversal flow.

**Correct Slope Angle for Drain Hose, Through the Wall View (SV Frame)**

Figure 58: Correct Slope Angle for Drain Hose (SV Frame).





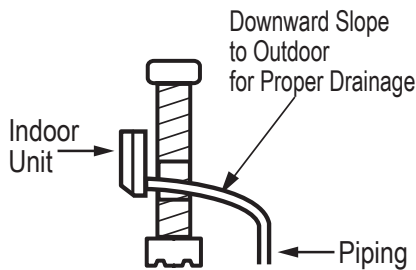
### Indoor Unit Condensate Drain Hose Installation, continued.

**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.

- 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 may need to be extended so that condensate can be properly routed away.
- The drain hose 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 recommended.

Figure 59: Correct Slope Angle for Drain Hose.



- Insert the drain hose >2 inches so it won't pull out of the field-supplied drain pipe.

Figure 60: SJ/SK Unit Drain Hose Extension.

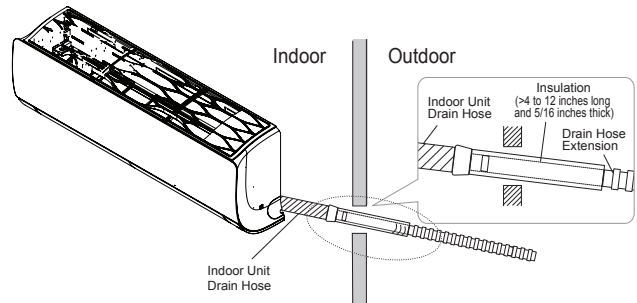
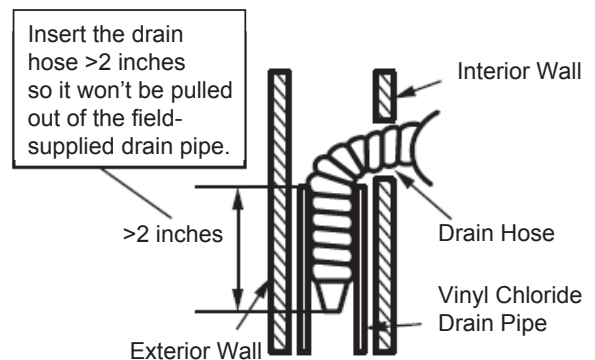


Figure 61: Inserting the Drain Hose >2 inches Into the Field-Supplied Drain Pipe.

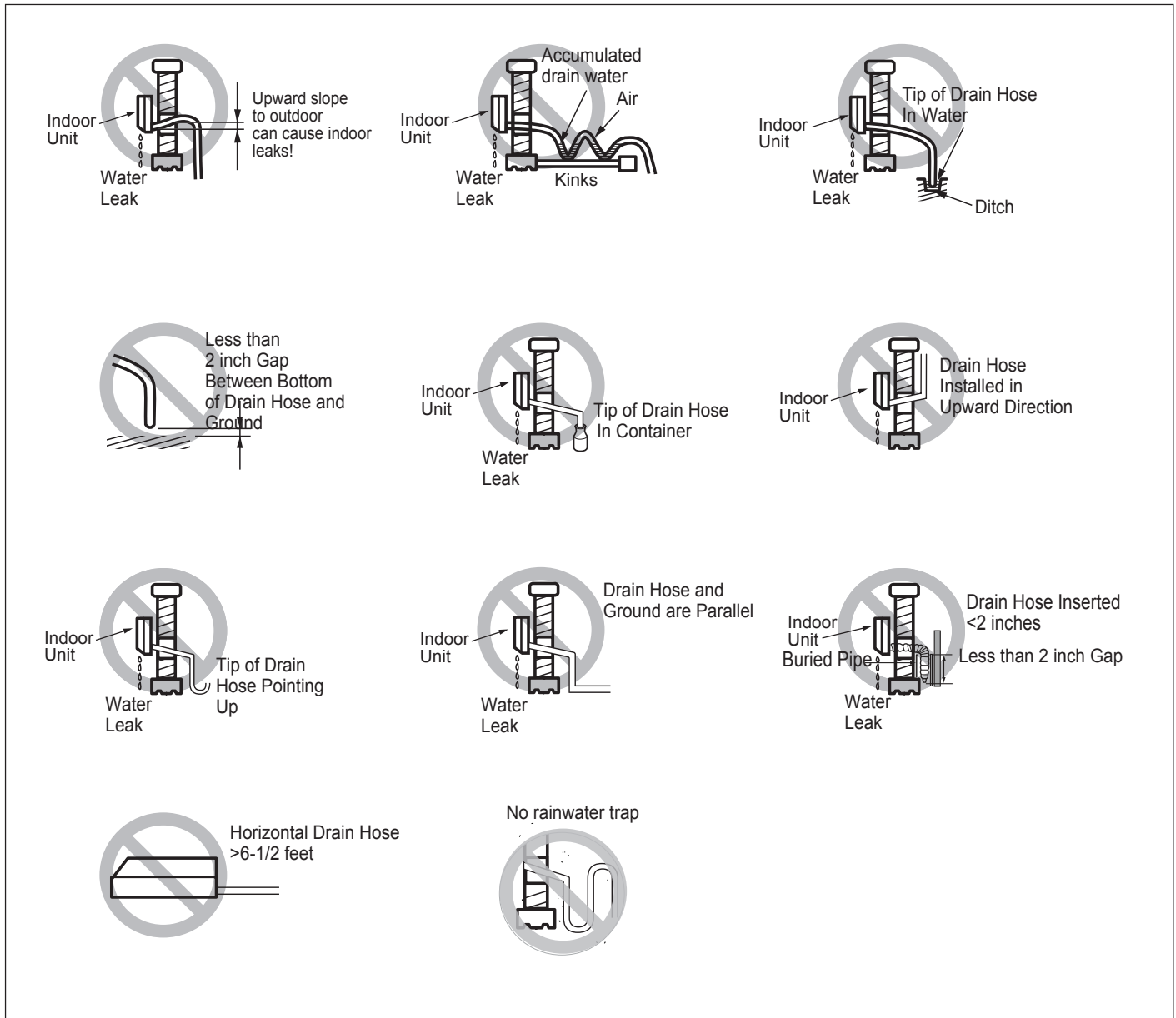


## Indoor Unit Drain Hose

### Indoor Unit Condensate Drain Hose Installation, continued.

See the following figures for proper drainage slope. Avoid piping the drain hose as shown here. These methods are incorrect and can cause leakage at the indoor unit site

Figure 62: Incorrect Slope Angles for the Drain Hose.





## Drain Leak Test (SF, SV Frames)

Perform a leak test 24 hours after the drainage system has been installed.

1. Lift up (Standard Indoor Units) and / or remove (Art Cool Gallery Indoor Units) the picture or front panel from the indoor unit chassis (A).
2. Remove any filters.
3. Manually set the up-and-down air direction louvers to the horizontal position (Standard Indoor Units).
4. Remove the screws that secure the front metal panel (Art Cool Gallery) or front panel to the indoor unit (Standard Indoor Units). Pull the lower left and right sides of the panel toward you and lift the panel off. (Standard Indoor Units).
5. Pour a glass of water on the evaporator (Art Cool Gallery, Standard Indoor Units) (B).
6. Verify the water flows correctly through the indoor unit drain hose to the drainage system without any leaks at the hose connections (B).

## Checking the Indoor Unit Drain Hose for Leaks (SJ/SK Frame)

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 63: Gallery Indoor Unit (SF Frame) Drain Leak Test.

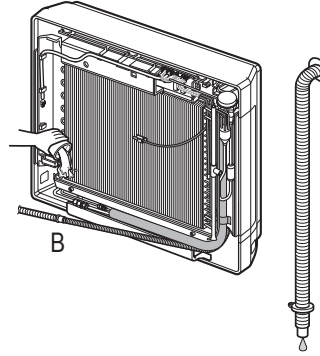


Figure 64: Wall-Mounted Indoor Unit (SV Frame) Drain Leak Test

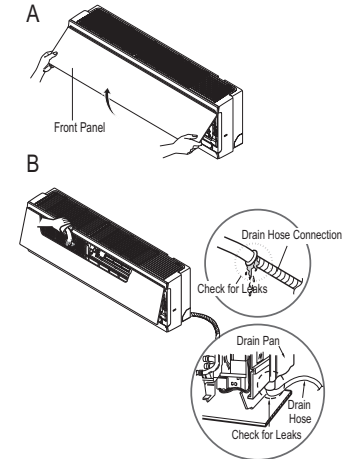
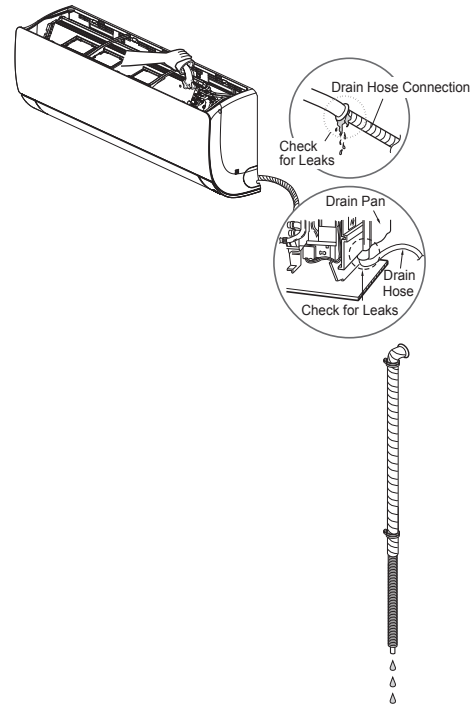


Figure 65: Checking for Leaks at the Indoor Unit.



## Piping Bundling

Gallery and wall-mounted indoor units allow for piping bundling. See the Figure on the right for proper pipe and cable bundling. Note the placement of the piping along with the necessary insulation material.

1. Wrap each pipe with proper insulation material.
2. Secure the piping by wrapping vinyl tape around the pipe. Use the narrow size tape for wrapping the actual pipe.
3. Drain hose can be included within the bundled piping. Wrap all of them together using the wider vinyl tape as shown. The end of the drain hose outlet must be routed above the ground.

### Note:

- If the drain hose is routed inside the room, insulate the hose with insulation material so that dripping condensation will not damage walls, floors, or furniture.
- Make sure the drain hose is positioned at the lowest side of the bundle. Positioning the drain hose at the top can cause the drain pan to overflow inside the indoor unit.

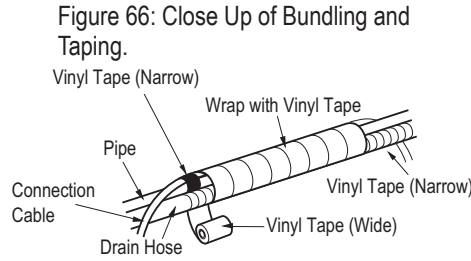
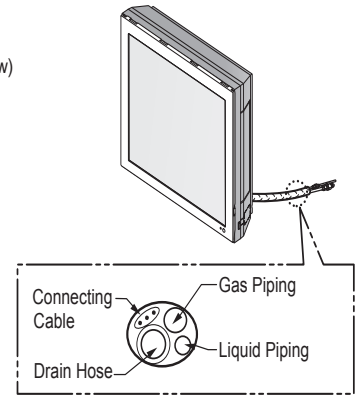


Figure 67: Example of Bundling Gallery Indoor Unit Piping, Drain Hose, and Connecting Cable.



## Insulating the Piping

Sufficiently insulate all cold surfaces to prevent moisture forming. All pipes must be insulated and each pipe must be separately wrapped. Use field-provided one-half (1/2) inch thick (or thicker) closed-cell insulation. The thickness may need to be increased based on ambient conditions and local codes.

Wrap all refrigerant piping including field-provided isolation ball valves and flexible pipe connection kits provided by LG. 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 the pipe surface and the surrounding insulation.

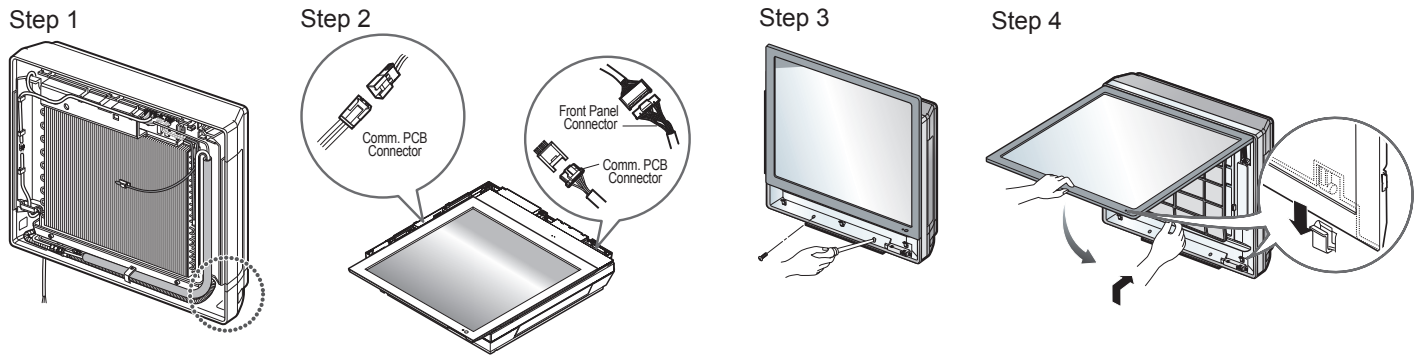
Protect insulation inside hangers and supports with a second insulation layer. Ensure insulation on all pipe passing through pipe hangers, inside conduit, and/or sleeves is not compressed.

**Finishing Installation — Gallery Indoor Units**

Before completing installation, the picture and front metal panels of the Gallery indoor unit must be re-installed. Before re-installing, verify that communications cable and power wiring between the outdoor and indoor units are connected.

1. Check if the side cover is assembled properly, especially if a knockout hole for the piping is used.
2. Verify if the drain hose and refrigerant piping is routed correctly from the side and the rear of unit.
3. Route the power wiring through the indoor unit's bottom left-hand groove (Step 1).
4. Make the connections to the communication PCB connector, and to the front panel connector (Step 2).
5. Attach the top part of the front metal panel, aligning it with the screw holes at the bottom (Step 3), and then secure the front metal panel with the factory-supplied screws.
6. Suspend the hooks of the picture panel in the bottom grooves (Step 4).

Figure 68: Finishing Gallery Indoor Unit Installation



# FINAL INSTALL

## Wall-Mounted Indoor Units

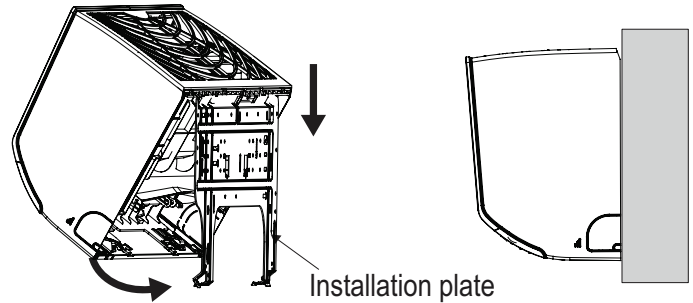
SV Frame

### Finishing Installation — Wall-Mounted Indoor Units

#### Mounting the Indoor Unit to the Installation Plate

1. Attach the three (3) hooks on the top of the indoor unit to the top edge of the installation plate. Verify the hooks are properly attached to the installation plate by gently shaking the indoor unit from side to side.
2. To fully anchor the indoor unit to the wall, push the bottom of the indoor unit against the installation plate until the bottom hooks snap into their slots (a click will be heard).

Figure 69: Locking the Indoor Unit onto the Installation Plate



#### Preparing for Piping / Electrical Connections

1. To prepare indoor unit for refrigerant piping, drain piping, and wiring connections, disengage bottom on indoor unit from installation plate by reversing Step 2 from previous procedure.
2. Unlock the tubing clamp from the indoor unit frame. For easier access between the bottom of the indoor unit and the wall, prop the clamp between the indoor unit frame and installation plate.

Figure 70: Accessing the Back of the Indoor Unit.

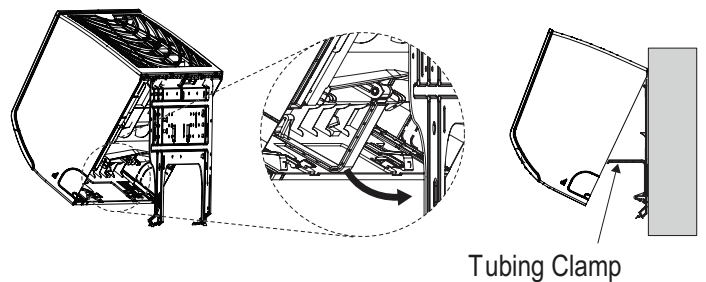
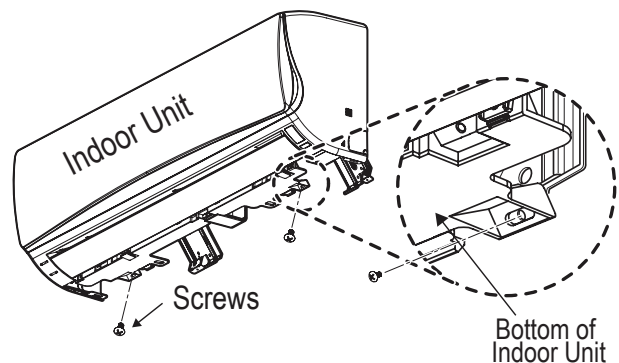
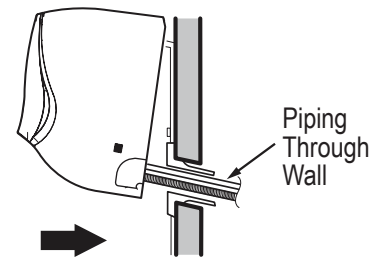


Figure 71: Final Installation Step.

#### Final Step

1. Push the tubing clamp back into its original position.
2. Verify the top hooks are properly attached to the installation plate by gently shaking the indoor unit from side to side.
3. To fully anchor the indoor unit to the wall, push the bottom of the indoor unit against the installation plate until the bottom hooks snap into their slots (a click will be heard).
4. Finish the assembly by securing the indoor unit to the installation plate with two screws, and assembling the cover.



## Reattaching the Indoor Unit Bottom Cover

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 72: Close Up of Bottom Cover Connections (Appearances May Vary Depending on Indoor Unit Model).

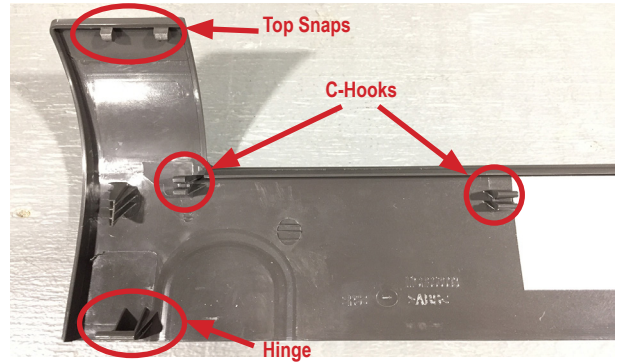


Figure 73: Inserting the Bottom Cover Hinges into the Indoor Unit Channels (Step 2).

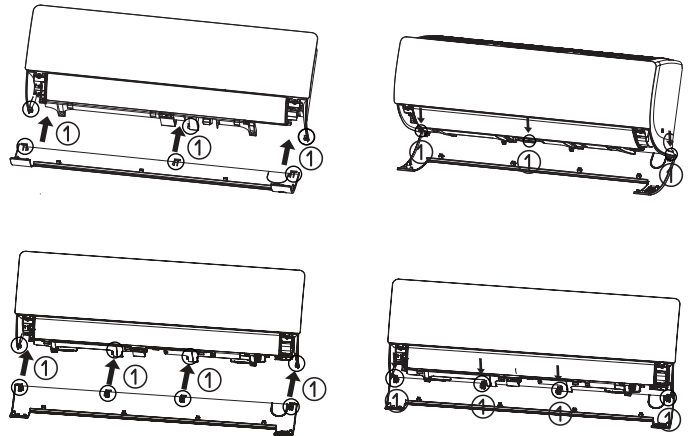


Figure 74: Securing the Bottom Cover C-hooks to the Indoor Unit Sockets (Step 3).

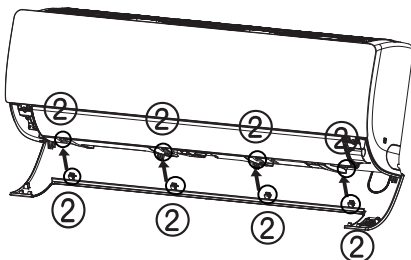


Figure 75: Snapping the Top Left and Right Sides (Step 4).

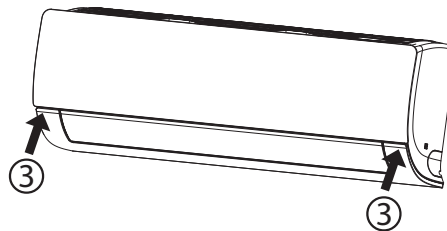
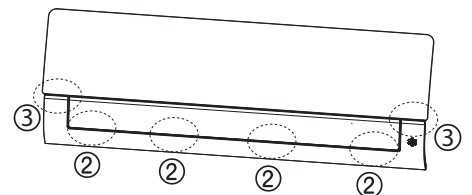


Figure 76: Checking that All Attachment Locations Are Secure (Step 5).



# FINAL INSTALL



## Wall-Mounted Indoor Units

SJ/SK Frame

Multi V Wall-Mounted Indoor Unit

### Air Filter Disassembly and Assembly

#### 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 77: Disassembling the Air Filter (Appearances May 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 78: Assembling the Air Filter (Appearances May Vary Depending on Indoor Unit Model).

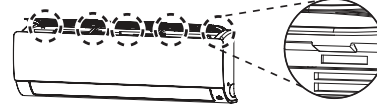
2. Matching Hooks to Top-Back Grooves.



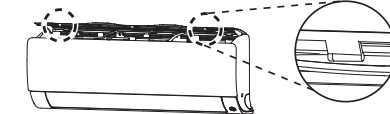
- Three (3) Top-Back Hooks to Grooves.



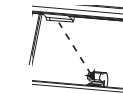
- Four (4) Top-Back Hooks to Grooves.



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.



**⚠ WARNING**

- All power wiring and communication cable installation must be performed by authorized service providers working in accordance with local, state, and National Electrical Code (NEC) regulations related to electrical equipment and wiring, and following the instructions in this manual. Failure to do so will lead to electric shock and bodily 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.
- Familiarize yourself with the location of the circuit breaker. Be sure that a 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.
- Undersized wiring will lead to unacceptable voltage at the unit and will cause a fire, which will cause bodily injury or death.
- Properly ground all outdoor units and indoor units. Ground wiring must always be installed by a qualified technician. Ground wiring is required to prevent accidental electrical shock during current leakage, which will cause bodily injury or death.
- 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 could include some amount of direct current. 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, physical injury or death.

**Note:**

- The information contained in this manual is intended for use by a trained electrician familiar with applicable local codes and the U.S. National Electric Code (NEC), and 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 or property damage.
- Consider ambient conditions (temperature, direct sunlight, inclement weather, etc.) when selecting, installing, and connecting the power wiring.
- Properly ground all outdoor units and indoor units. Ground wiring must always be installed by a qualified technician. Improperly ground wire can cause communication problems from electrical noise, and motor current leakage.
- If there is a possibility of reversed phase, phase loss, momentary blackout, or the power goes on and off while the system is operating, install a field-supplied phase loss protection circuit. If the system operates in reversed phase, etc., it will damage the compressors and other components.
- 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.

**Separating Power Wiring and Communication Cables**

- ⓧ Avoid running the power wiring and communication cable alongside each other; there is a strong likelihood of operation malfunction due to electrostatic and electromagnetic interference. ⓧ Do not run both in the same conduit.
- If running the power wiring and communication cable alongside each other cannot be avoided, see the table below for minimum required distances.

Table 18: Power Wire and Communications Cable Minimum Required Separation Allowable Distances.

Capacity of Power Supply Wiring (current)		Minimum Required Distance <sup>1,2</sup>
100V or more	10A	12 inches
	50A	20 inches
	100A	40 inches
	Exceeding 100A	60 inches

<sup>1</sup>The figures above are based on parallel lengths up to 328 feet long. For lengths in excess of 328 feet, the distances will have to be recalculated in direct proportion to the additional line lengths involved.

<sup>2</sup>If the power supply waveform continues to exhibit some distortion, space between the power wiring and communication cable must be increased.

**Note:**

- ⓧ Do not secure the power wiring and communication cables together. It will result in equipment malfunction.
- ⓧ Do not run the power wiring and the communication cable in the same conduit. It will result in equipment malfunction.



### 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 nickle plate over steel. Use appropriate crimping tool to attach the ring or fork terminals at all power wiring and control cable terminations. To install:

- Firmly attach the wire; secure in a way to prevent external forces from being imparted to the terminal block.
- Use an appropriately sized screwdriver for tightening the terminals.
- Do not overtighten the connections; overtightening 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 80: Close up of a Typical Ring Terminal.

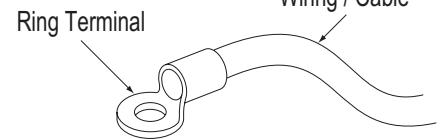
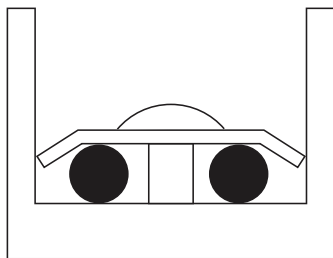
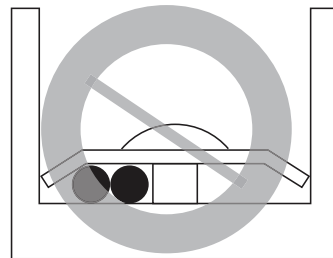


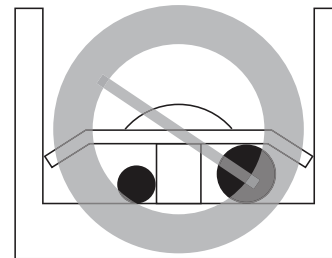
Figure 81: Proper and Improper Power Wiring Connections.



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



Do not terminate two wires on one side.



Do not terminate different gauge wires to a terminal block.

● :Copper Wire

### 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.

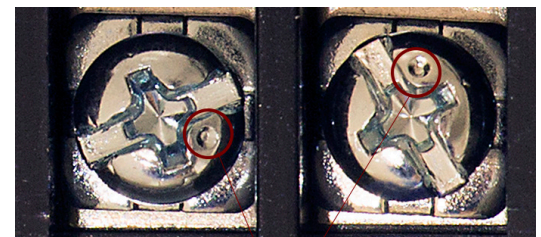
### Terminal Connections

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 overtighten the connections — overtightening 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 heat recovery units) are wired in relation to the outdoor unit.
- Do not include splices or wire nuts in the communication cable.

Figure 79: JIS Screws.



JIS DIMPLES



## Power Supply / Power Wiring Specifications

Outdoor unit(s) and indoor units / heat recovery units must be provided power from separate breakers. For detailed information, see the Multi V Outdoor Unit Engineering and Installation Manuals on [www.lghvac.com](http://www.lghvac.com).

### Indoor Units (and Heat Recovery Units)

- Indoor units (and heat recovery units) require 1Ø, 208-230V, 60Hz power, but each unit draws minimal power.
- Where permitted by NEC and local codes, multiple indoor units (and heat recovery units) can be powered from a single breaker.
- Service switches typically must be installed for each indoor unit (and each heat recovery unit).
- Ground each indoor unit (and heat recovery unit) separately to a solid earth ground source per NEC and local code requirements.

### **⚠ WARNING**

- *All power wiring installation must be performed by trained service providers working in accordance with local, state, and NEC regulations related to electrical equipment and wiring, and following the instructions in this manual. Failure to do so will lead to electric shock and bodily injury or death.*
- *Use specified wiring for connections, and ensure that external force is not imparted to terminal connections. If connections firmly attached, it will generate heat and / or cause a fire, resulting in physical injury or death.*
- *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 electric shock, physical injury or death.*
- *Use the appropriate type of overcurrent protection. Generated overcurrent will include some amount of direct current, and if the appropriate type of overcurrent protection is not installed, there is a risk of fire, electric shock, and physical injury or death.*
- *Ground wiring is required to prevent accidental electrical shock during current leakage, communication problems from electrical noise, and motor current leakage. Ⓞ Do not connect the ground line to the pipes. There is risk of fire, electric shock, explosion, physical injury or death.*
- *Install a main shutoff switch that interrupts all power sources simultaneously. There is risk of fire, electric shock, explosion, physical injury or death.*

### **Note:**

- *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 could 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 National Electrical Code-approved earth ground can result in property damage and equipment malfunction.*

## Communications Cable Specifications

### Communication Cable Specifications From Outdoor Unit to Indoor Units / Heat Recovery Units

- Communication cable from Master Outdoor Unit to Indoor Units / Heat Recovery Units is to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Master Outdoor Unit chassis only. ⚠ Do not ground the Outdoor Unit to Indoor Units / Heat Recovery Units communication cable at any other point. Wiring must comply with all applicable local and national codes.
- Cable shields between the connected devices must be tied together and continuous from the master outdoor unit to the last component connected.
- Start the communication cable at the master outdoor unit and route to the indoor units / heat recovery units in a daisy chain configuration. ⚠ Do not install in a starburst configuration.
- Indoor Unit / Heat Recovery Unit Communication Bus: The communication terminals are labeled differently among the indoor units, depending on type (currently for indoor units: A / B, 3[A] / 4[B], or 3 / 4; for heat recovery units: A / B). Refer to the wiring diagram schematic found in the indoor unit itself, or to the indoor unit wiring diagrams for more information. Match IDU A and B terminals on outdoor unit to A (3) and B (4) terminals on indoor units / heat recovery units.
- Insulation as required by NEC and local codes.
- Rated for continuous exposure of temperatures up to 140°F.
- Maximum allowable communication cable length is 3,281 feet.

### ⚠ WARNING

- Ground wiring is required to prevent accidental electrical shock during current leakage, communication problems from electrical noise, and motor current leakage. ⚠ Do not connect the ground line to the pipes. There is risk of fire, electric shock, explosion, physical injury or death.
- ⚠ Never ground the shield of the communications cable to the indoor unit frame or other grounded entities of the building. Inadequate connections will generate heat, cause a fire, and physical injury or death.

### Note:

- Always verify the communication cable is connected to a communications terminal on the outdoor unit(s). ⚠ Never apply line voltage power to the communication cable connection. If contact is made, the PCBs will be damaged.
- ⚠ Never use a common multiple-core communications cable. Each communications bus must be provided a separate cable (i.e., between outdoor unit(s) and indoor units, outdoor units and central controller(s)). If communications cables of separate systems are wired using a common signal multiple-core cable, it will result in a poor communications signal and unacceptable system operation.

Figure 82: Correct Master Outdoor Unit to Indoor Unit / Heat Recovery Unit Communication Wiring—Daisy Chain Configuration.

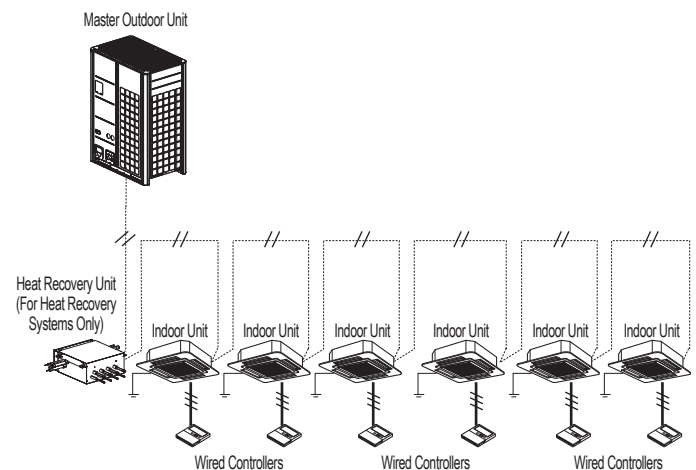
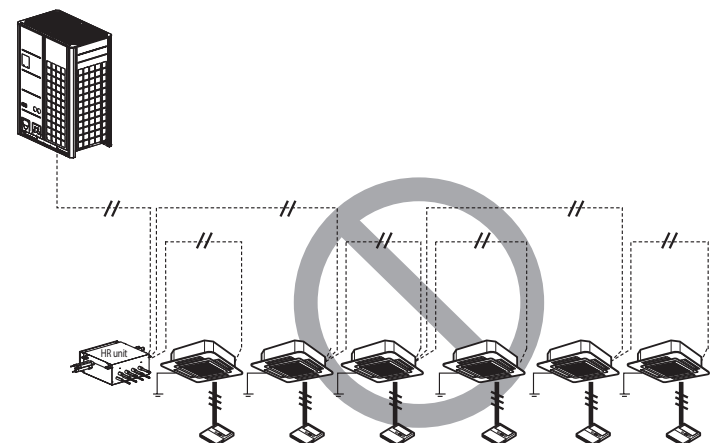


Figure 83: Incorrect Master Outdoor Unit to Indoor Unit / Heat Recovery Unit Communication Wiring—Starburst Configuration.



## Communications Cable Specifications 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 the length needs to be 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 84: One Example of Indoor Unit to Zone Controller Connection.

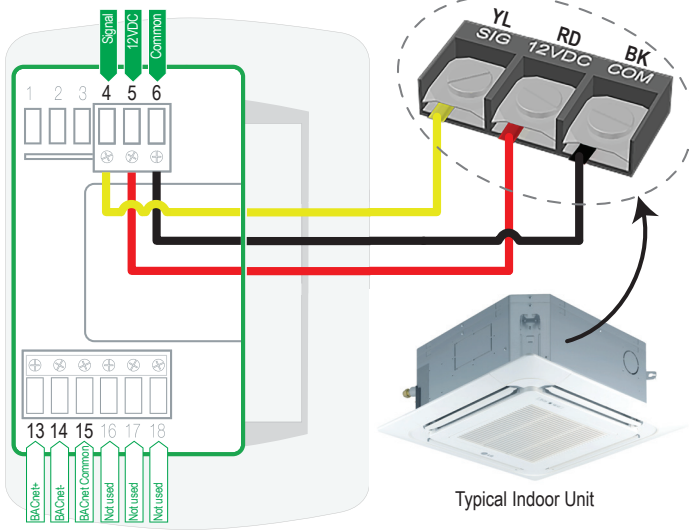
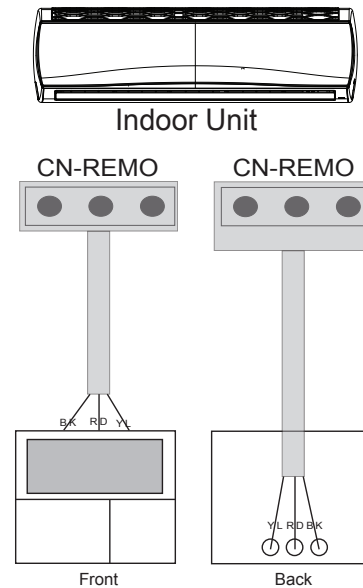


Figure 85: Another Example of Indoor Unit to Zone Controller Connection.



### Note:

Cable connected to Zone Controller is the factory default connection.

## Communications Cable Specifications

### Communications Cable Specifications 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 and national codes.
- From the master indoor unit to the slave indoor unit(s), daisy chain using 22 AWG, 3-conductor, twisted, stranded, unshielded (⚠ Do not attach wire to 12VDC terminal to the slave indoor units). All wiring must comply with all applicable local and national codes.

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

Use Group Control Kit (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.

**Note:**

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

Figure 86: Example of Indoor Unit Group to Zone Controller Connections (Sig-12V-GND [Comm.] Terminal).

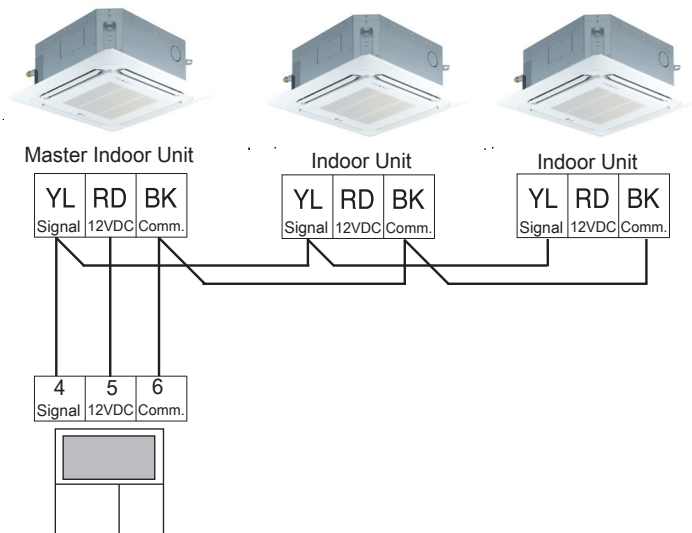
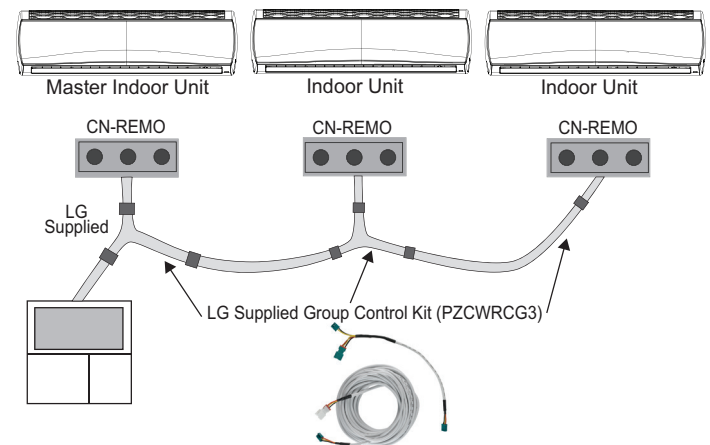


Figure 87: Example of Indoor Unit Group to Zone Controller Connections (CN-REMO).



Multi V Wall-Mounted Indoor Unit

## Connecting the Power Wiring / Communication Cable

### ⚠ DANGER

High voltage electricity is required to operate this system. Adhere to the National Electrical Codes and these instructions when wiring. Always ground the unit following local, state, and National Electrical Codes. Read the safety summary at the beginning of this manual.

- 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.
- Properly tighten all power connections. Loose wiring will overheat at connection points, causing a fire, physical injury or death.

### Note:

- Connect the indoor unit input power cable but ⓧ do not apply power to the indoor unit until authorized to do so by the system commissioning agent. Inappropriate power connection can result in equipment damage and will void the LG limited liability warranty.
- When connecting the communications bus between the outdoor unit, indoor unit(s), and heat recovery unit(s), it does not matter what physical path or route the wire takes. The installer can use discretion when choosing the order the components are connected to the communications bus, but must maintain the daisy chain and polarity configuration.
- Failure to follow any of these power and communications wiring guidelines or instructions will cause communications errors and unit malfunction.

### ⓧ Don'ts

- Never use wire caps and never splice communications cables.
- Never connect zone controllers or other central controllers or LG building management system gateways to the indoor unit / outdoor unit communications cable.

### Connection Procedure

Indoor unit installation best practices are to connect control wiring (low voltage) and then connect power wiring (high voltage). ⓧ Do not apply power to the indoor unit or any Multi V system component until authorized to do so by the system commissioning agent.

1. Ensure the input power is disconnected and there is no power on the power input cable.
2. Remove the knock-out plugs from the control box. Remember the communications cable and the power cable must enter the control box through different knockouts.
3. Field-install a plastic or rubber grommet in the knockout holes to prevent wire chaffing.
4. If using conduit, connect the conduit to the control box using field-provided fittings and industry best-practice procedures.
5. Separately route the power wiring and communications cables to the unit's terminal block (see figures on the following pages). ⓧ Do not route the communications cable near the power cable. Provide at least three (3) to four (4) inches of slack cable at each indoor unit.

### Note:

Power wiring is field supplied. Wire size is selected based on the larger MCA value, and must comply with the applicable local and national codes.


## Connection Procedure

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6. Connect the power cable to the terminal block connections. Ensure the screws securely connect the wire to the terminals and are not loose.
7. Connect the field-provided communications cable to the 3(A) and 4(B) terminal block connections. Polarity matters on the outdoor unit to indoor unit / heat recovery unit communications bus, and must be maintained throughout the entire system.. Be sure to connect 3(A) terminals to A terminals and 4(B) terminals to B terminals. Refer to the next pages for indoor unit wiring connections, the Outdoor Unit Installation Manual for information regarding the outdoor unit and heat recovery unit wiring connections, or review the wiring diagrams on the applicable units.

### Note:

- Cross connecting the 3(A) and 4(B) terminals will cause communications errors and system malfunction.
- Field-provided communication cable between Master ODU to IDUs / HRUs to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Master ODU chassis only.  Do not ground the ODU to IDUs / HRUs communication cable at any other point. Wiring must comply with all applicable local and national codes.

8. If a remote controller is to be installed, connect the remote controller's cable to the indoor unit's remote controller connection. Controller connections depend on type of indoor unit being installed. Some indoor units use terminal block connections; other indoor units use Molex connections. See the wiring diagram for each specific indoor unit.

9. Connect any additional cables required for the installation such as those for the decoration panels.

Location of Power Wiring/Communication Cable in Wall Mounted SJ, SK Frames

Figure 88: Location of Power Wiring / Communications Cable Terminals in SJ and SK Frame Wall-Mounted Indoor Units.

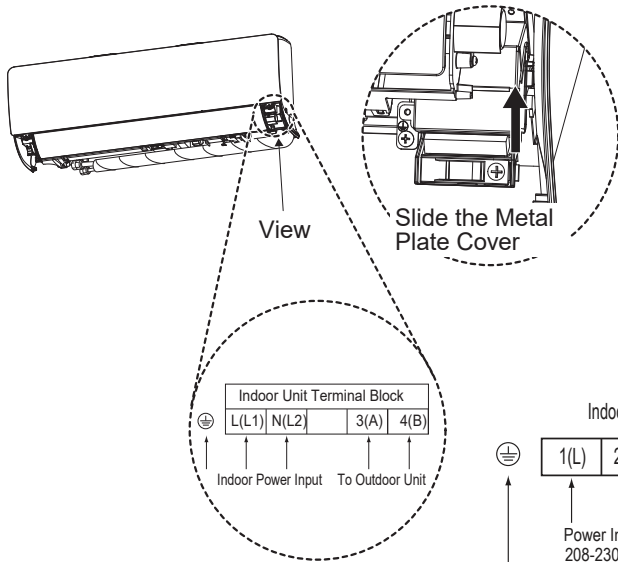


Figure 90: Simplified View of Indoor Unit Terminal Connections—SJ and SK Wall-Mounted Frames.

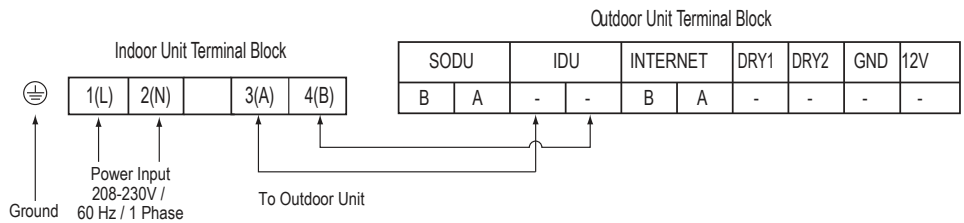
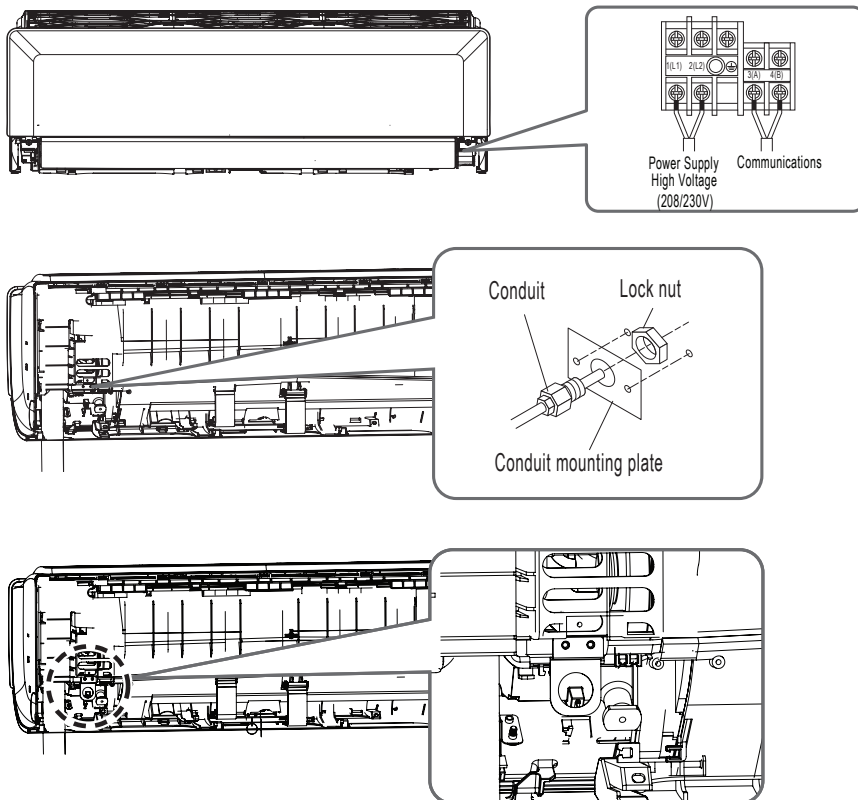


Figure 89: Typical SJ and SK Frame Wiring/ Cable Routing.





# ELECTRICAL WIRING DIAGRAM

## Art Cool™ Mirror

SJ and SK Frames

Figure 91: ARNU053~153SJR4 and ARNU183-243SKR4 Wiring Diagram.

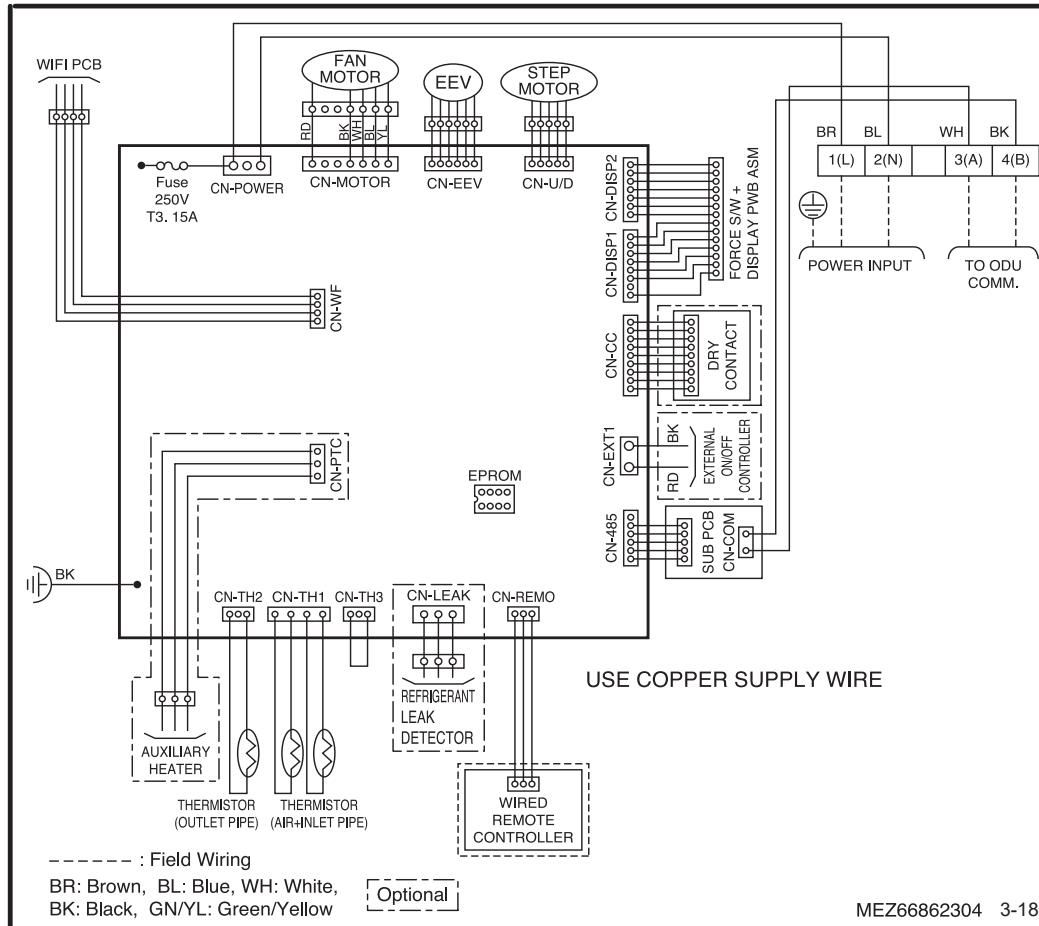


Table 19: SJ and SK Frame Wiring Diagram Legend.

PCB Connection	Purpose	Function
CN-POWER	AC power supply	AC Power line input for indoor controller
CN-MOTOR	Fan motor output	Motor output of BLDC
CN-EEV	EEV output	EEV control output
CN-U/D	Step motor	Step motor output
CN-DISP2	Display	Display of indoor status
CN-DISP1	Display	Display of indoor status
CN-CC	Dry contact	Dry contact connection
CN-EXT1	External ON / OFF controller	External ON / OFF controller connection
CN-485	Communication	Connection between indoor and outdoor units
CN-REMO	Remote controller	Remote control connection
CN-LEAK	Refrigerant leak detector	Refrigerant leak detector connection
CN-TH3	Float switch	Float switch connection
CN-TH1	Return air and inlet pipe thermistor	Return air and inlet pipe thermistor connection
CN-TH2	Outlet pipe thermistor	Outlet pipe thermistor connection
CN-PTC	Auxiliary heater	Auxiliary heater connection
CN-WF	Wi-Fi module	Wi-Fi module connection

\*To enable Generation 4 features, outdoor unit DIP switch no. 3 must be set to ON. Please refer to the Multi V 5, Multi V IV, Multi V Water IV, Multi V S Engineering Manual for additional information.



Figure 92: ARNU053~153SJA4 and ARNU183-243SKA4 Wiring Diagram.

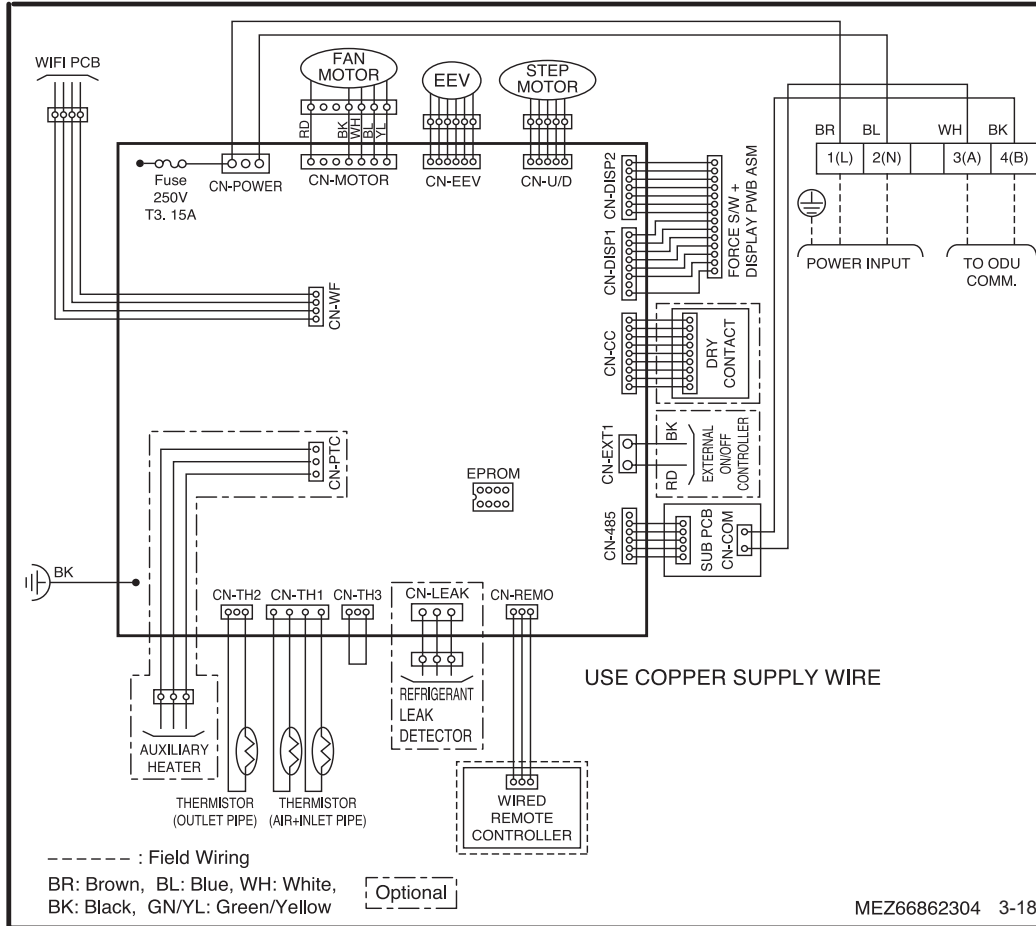


Table 20: SJ and SK Frame Wiring Diagram Legend.

PCB Connection	Purpose	Function
CN-POWER	AC power supply	AC Power line input for indoor controller
CN-MOTOR	Fan motor output	Motor output of BLDC
CN-EEV	EEV output	EEV control output
CN-U/D	Step motor	Step motor output
CN-DISP2	Display	Display of indoor status
CN-DISP1	Display	Display of indoor status
CN-CC	Dry contact	Dry contact connection
CN-EXT1	External ON / OFF controller	External ON / OFF controller connection
CN-485	Communication	Connection between indoor and outdoor units
CN-REMO	Remote controller	Remote control connection
CN-LEAK	Refrigerant leak detector	Refrigerant leak detector connection
CN-TH3	Float switch	Float switch connection
CN-TH1	Return air and inlet pipe thermistor	Return air and inlet pipe thermistor connection
CN-TH2	Outlet pipe thermistor	Outlet pipe thermistor connection
CN-PTC	Auxiliary heater	Auxiliary heater connection
CN-WF	Wi-Fi module	Wi-Fi module connection

\*To enable Generation 4 features, outdoor unit DIP switch no. 3 must be set to ON. Please refer to the Multi V 5, Multi V IV, Multi V Water IV, Multi V S Engineering Manual for additional information.

### Location of Power Wiring/Communication Cable in Art Cool Gallery SF Frame

Figure 93: Location of Power Wiring / Communications Cable Terminals in SF Frame Gallery Indoor Units.

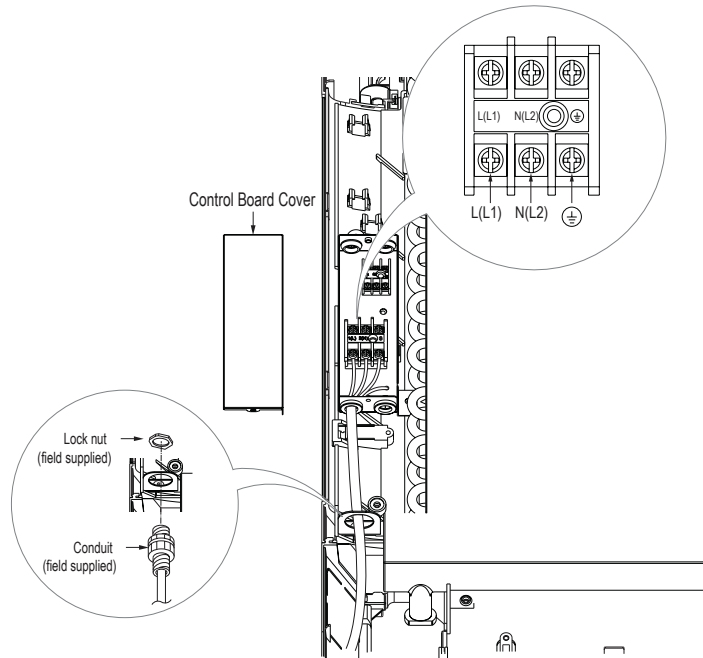
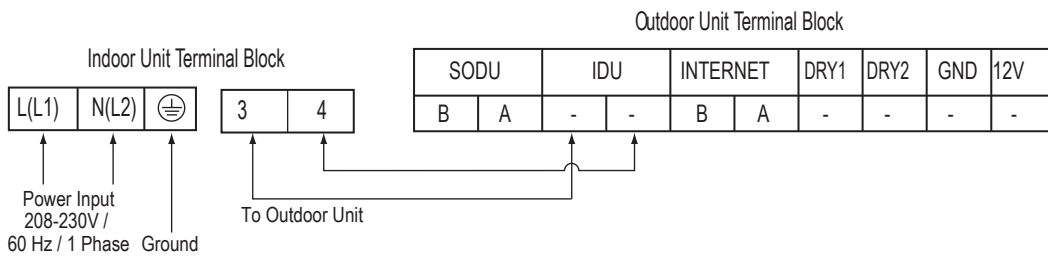


Figure 94: Simplified View of Indoor Unit Terminal Connections—SF Gallery Frames.



Multi V Wall-Mounted Indoor Unit

Figure 95: Art Cool Gallery (SF Frame) Wiring Diagram

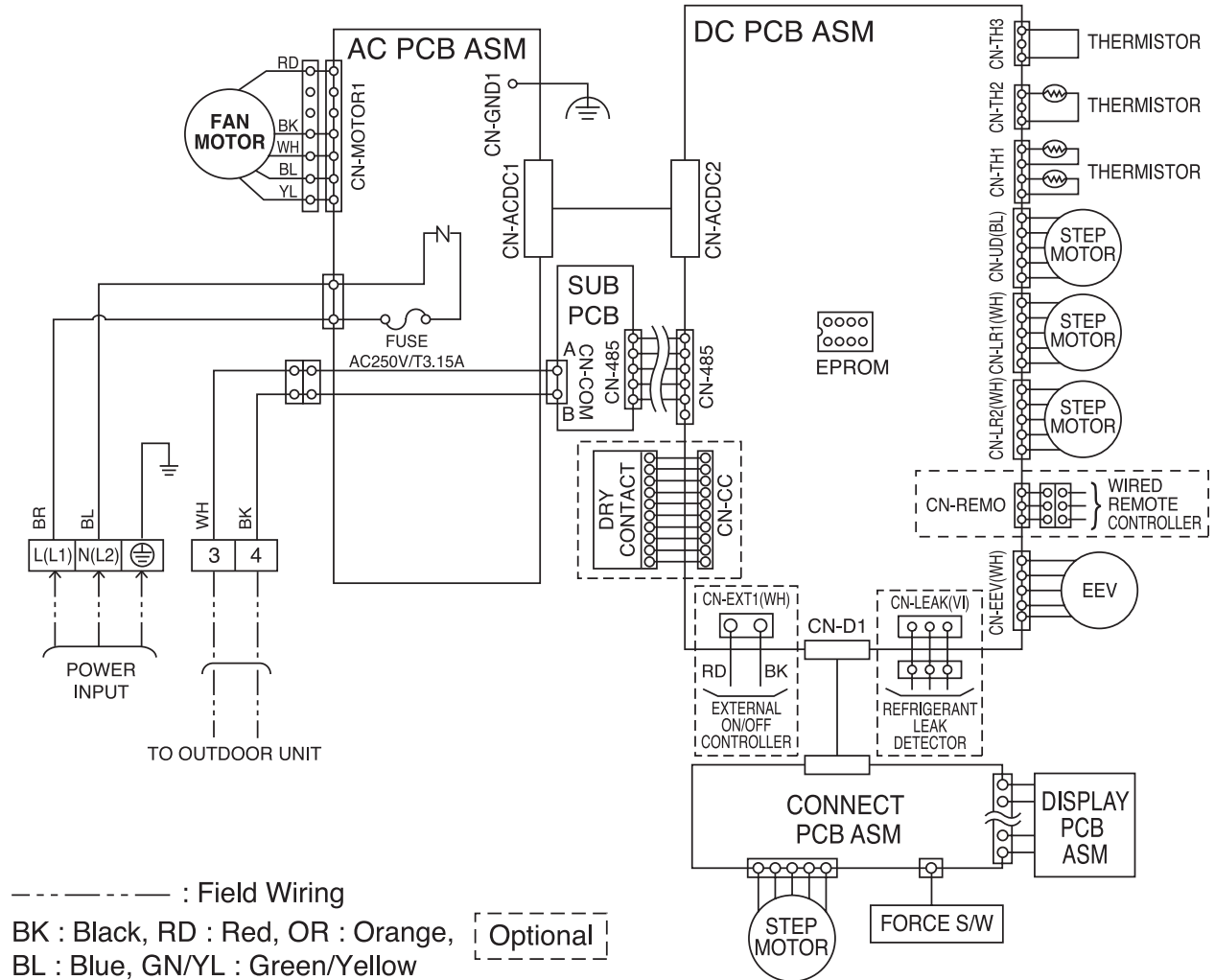


Table 21: Art Cool Gallery (Gen 4) SF Chassis Wiring Diagram Legend.

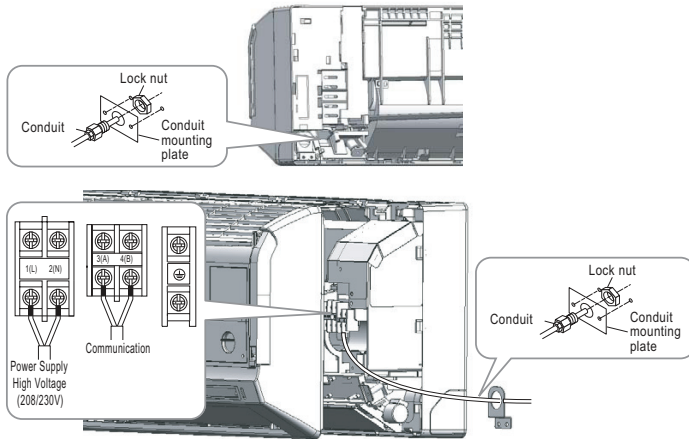
PCB Connection	Purpose	Function
CN-TH3	Pipe out thermistor	Pipe out thermistor connection
CN-TH2	Pipe in thermistor	Pipe in thermistor connection
CN-TH1	Return air thermistor	Return air thermistor connection
CN-UD	Step motor	Step motor output
CN-LR1	Step motor	Step motor output
CN-LR2	Step motor	Step motor output
CN-REMO	Wired remote controller	Wired remote controller connection
CN-EEV	EEV output	EEV control output
CN-EXT1	External on/off controller	External on/off controller connection
CN-CC	Dry contact	Dry contact connection
CN-485	Communication	Connection between indoor and outdoor units

\*To enable Generation 4 features, outdoor unit DIP switch no. 3 must be set to ON. Please refer to the Multi V 5, Multi V IV, Multi V Water IV, Multi V S Engineering Manual for additional information.

## Wall Mounted SV Frame

### Location of Power Wiring/Communication Cable in Wall Mounted SV Frame

Figure 96: Location of Power Wiring / Communications Cable Terminals in SV Frame Wall-Mounted Indoor Units.



Multi V Wall-Mounted Indoor Unit

Figure 97: Simplified View of Indoor Unit Terminal Connections—SV Wall-Mounted Frames.

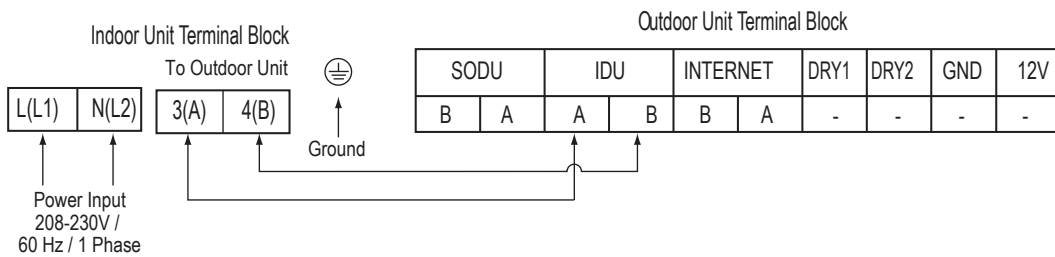
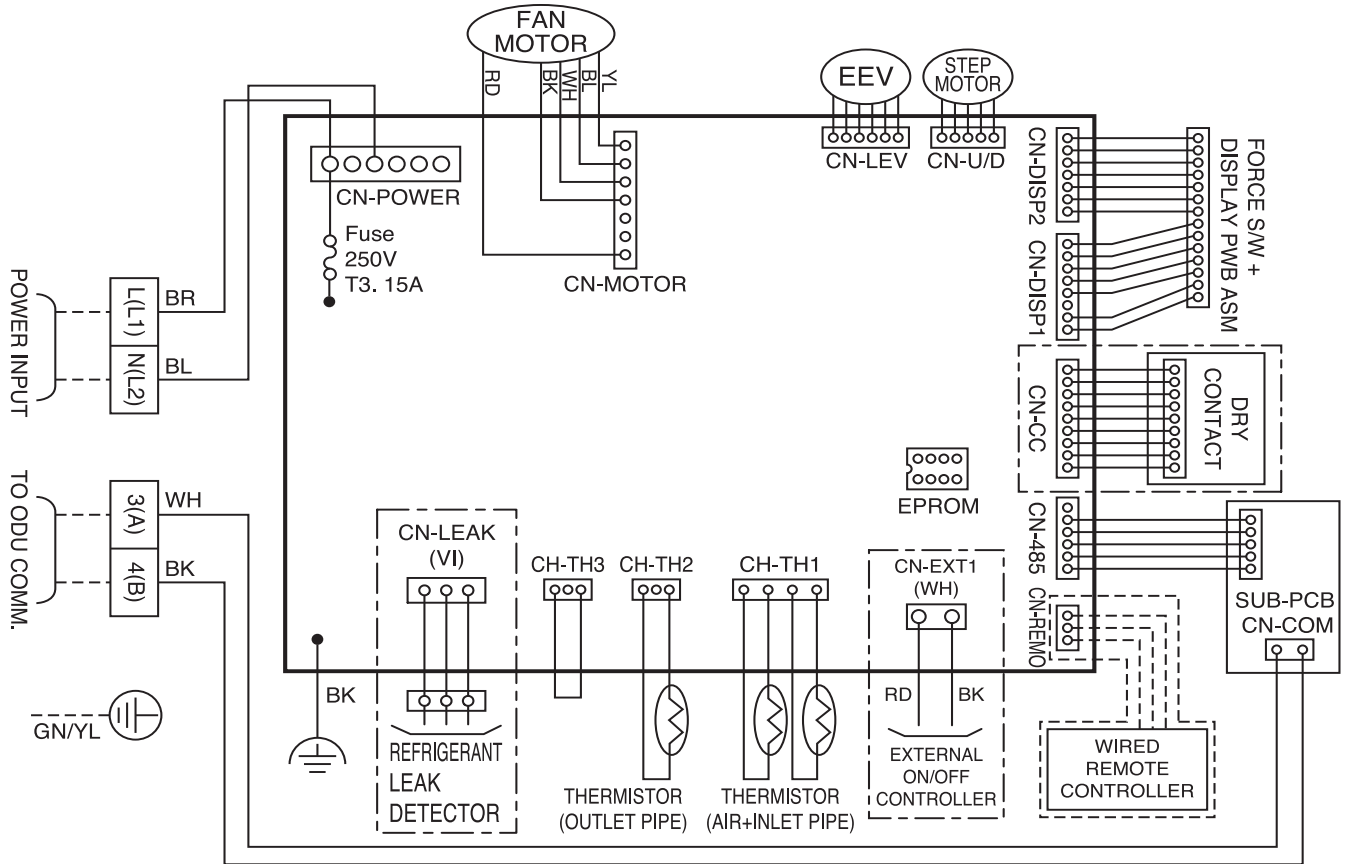


Figure 98: Standard Wall-Mounted (SV Frame) Wiring Diagram



BK : Black    RD : Red    OR : Orange    WH : White    [Optional]    - - - - - : Field Wiring  
 BL : Blue    BR : Brown    GN/YL : Green/Yellow

Table 22: Standard (Gen 4) Wall-Mounted SV Chassis Wiring Diagram Legend

PCB Connection	Purpose	Function
CN-POWER	AC Power supply	AC Power line input for indoor controller
CN-MOTOR	Fan motor output	Motor output of BLDC
CN-LEV	EEV output	EEV control output
CN-U/D	Step motor	Step motor output
CN-DISP2	Display	Display of indoor status
CN-DISP1	Display	Display of indoor status
CN-CC	Dry contact	Dry contact line
CN-485	Communication	Connection between indoor and outdoor units
CN-REMO	Remote controller	Remote control line
CN-EXT1	External ON / OFF controller	External ON / OFF controller connection
CN-TH1	Return air and inlet pipe thermistor	Return air and inlet pipe thermistor connection
CN-TH2	Outlet pipe thermistor	Outlet pipe thermistor connection
CN-TH3	Float switch	Float switch connection

\*To enable Generation 4 features, outdoor unit DIP switch no. 3 must be set to ON. Please refer to the Multi V 5, Multi V IV, Multi V Water IV, Multi V S Engineering Manual for additional information.

## Controller and Optional Wall-Mounted Sensor Installation

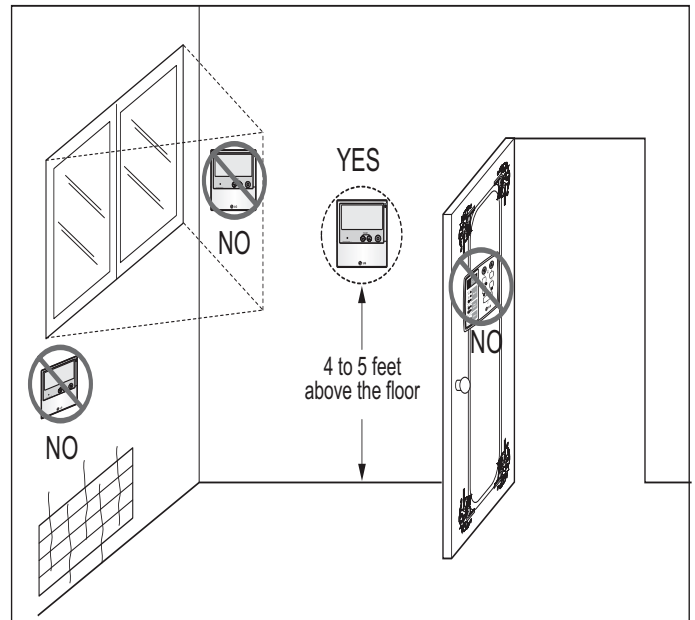
### Wired Controller Installation

Ceiling Cassette 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 (field supplied; see submittals for communication cable specifications).
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 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 may 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.
- 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.

**LGRED° Technology**

LGRED technology is included in Multi V 5 air-source units produced after February 2019. The feature allows heat pump or heat recovery systems to operate in heating only mode (i.e., all indoor units in heating mode) down to -22°F outdoor ambient wet bulb by updating the main PCB software (v1.26) and replacing an air temperature sensor. Multi V 5 air-source units without these changes can only operate down to -13°F. For more information, contact your local LG sales representative.

**PRHR\*3 Heat Recovery Units**

The PRHR\*3A series of heat recovery units were released in June 2018, and are not automatically backwards compatible with all LG manufactured VRF air / water source units. The 3A heat recovery units will be compatible with many LG manufactured air source / water source units if the its “Starting Production Date,” the “Production Starting Serial No.,” and / or the “Upgrade Software Service” dates fall after the dates shown below (see table).

LG VRF systems can operate with both old 2A heat recovery units and new 3A heat recovery units if the outdoor unit software has been upgraded. If a system includes a mix of both old and new heat recovery units, system design must follow 2A heat recovery unit series piping rules. For more information, contact your local LG sales representative.

Table 23: PRHR\*3 Heat Recovery Unit to Air / Water Source Unit Compatibility.

	Model	Starting Production Date	Production Starting Serial No.	Upgrade Software Service
<b>Multi V 5 with LGRED*</b>	ARUM****TE5	February 1, 2019	1902xxx	N/A
<b>Multi V 5</b>	ARUM****TE5	February 1, 2018	1802xxx	September 28, 2018
<b>Multi V S</b>	ARUB060GSS4	October 1, 2018	1810xxx	September 28, 2018
<b>Multi V Water IV</b>	ARWB****AS4	October 1, 2018	1810xxx	September 28, 2018
<b>Multi V IV</b>	ARUB****TE4	N/A	N/A	October 31, 2018
<b>Multi V II and III</b>	ARUB****TE2, ARUB****TE3	N/A	N/A	N/A
<b>Multi V Water II</b>	ARWB****A2	N/A	N/A	N/A

\*Low ambient performance with LGRED° heat technology is included in Multi V 5 air source units produced after February 2019.

**Generation 4 Indoor Units**

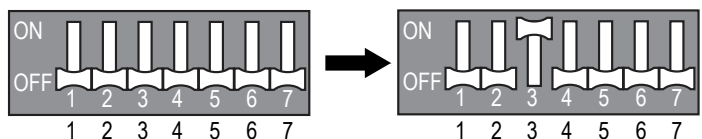
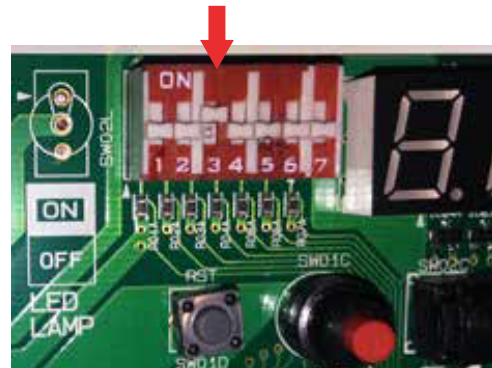
LG’s indoor units are designated Generation 4 (Gen 4). For Gen 4 indoor units to operate with Gen 4 indoor unit features, the air conditioning system must meet the following requirements:

- All indoor units, heat recovery units, and air / water source units must be Gen 4 or higher.
- All air / water source units must have Gen 4 or higher software factory or field installed.
- Air / water source units DIP switch 3 must be set to ON (factory default setting is OFF).
- All controllers must support Gen 4 indoor unit features.

The figure at right shows the outdoor unit DIP switch. All air and water source units, indoor units, heat recovery units, and controllers in a system must be Gen 4 compatible or the system will not operate with Gen 4 indoor unit features.

Figure 99: Location and Setting of Outdoor Unit DIP Switch 3.

Air/Water Source Unit DIP Switch No. 3



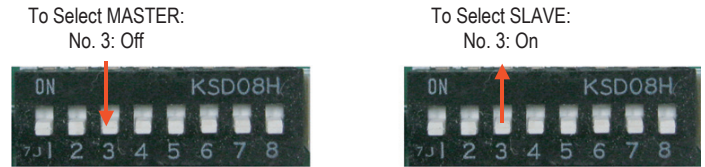


## DIP Switch Settings

### DIP Switch Settings

See the next pages for group control configurations. If the indoor unit is a master, set switch 3 of the indoor unit's DIP switch to Off. If the indoor unit is a slave, set switch 3 of the indoor unit's DIP switch to On. (See figures at right.)

Figure 100: Indoor Unit Master / Slave DIP Switch Settings.



- Some indoor units do not have a DIP switch bank on the PCB. It is possible to set these units as master or slave with a wireless controller. Refer to the wireless controller manual for information.

### Indoor Unit Control Configurations

The method and configuration of controlling indoor units will vary according to system requirements, and the indoor unit(s) installed. The next few pages show examples of typical control configurations.

#### Group Control - Method 1

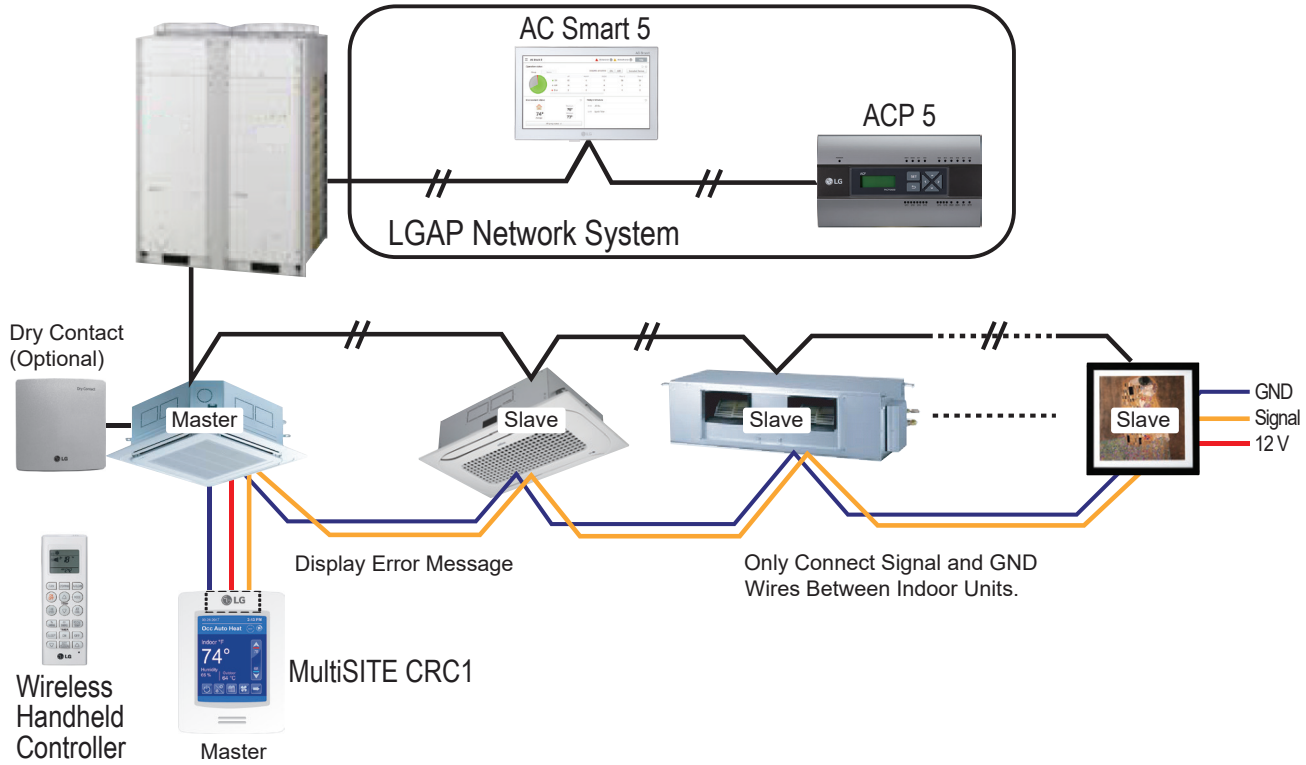
Controls up to 16 indoor units with one wired remote controller (group control). In group control, it is possible to use the following functions (depending on the indoor unit):

- Operation selection, stop or mode
- Temperature settings and room temperature check
- Current time change
- Airflow rate (high, middle, low)
- Reservation settings
- Set only one indoor unit in a group to master; set the others to slave. If master / slave(s) are not set properly in a group application, a malfunction will occur.
- All types of indoor units can be configured in a Group Control - Method 1 configuration.
- A wireless remote controller can be used at the same time as a wired controller.
- A dry contact and central controller can be connected at the same time (to a master indoor unit only).
- A central controller can control all indoor units in a group by controlling the master unit of the group.
- ⓧ Slave indoor units cannot be individually controlled by the central controller.
- If an error occurs at an indoor unit, the error code is displayed at the wired remote controller. Indoor units not in error can still be controlled.



Group Control - Method 1

Figure 101: Group Control - Method 1, One Wired Remote Controller Configured as a Master for Indoor Unit Group Control.



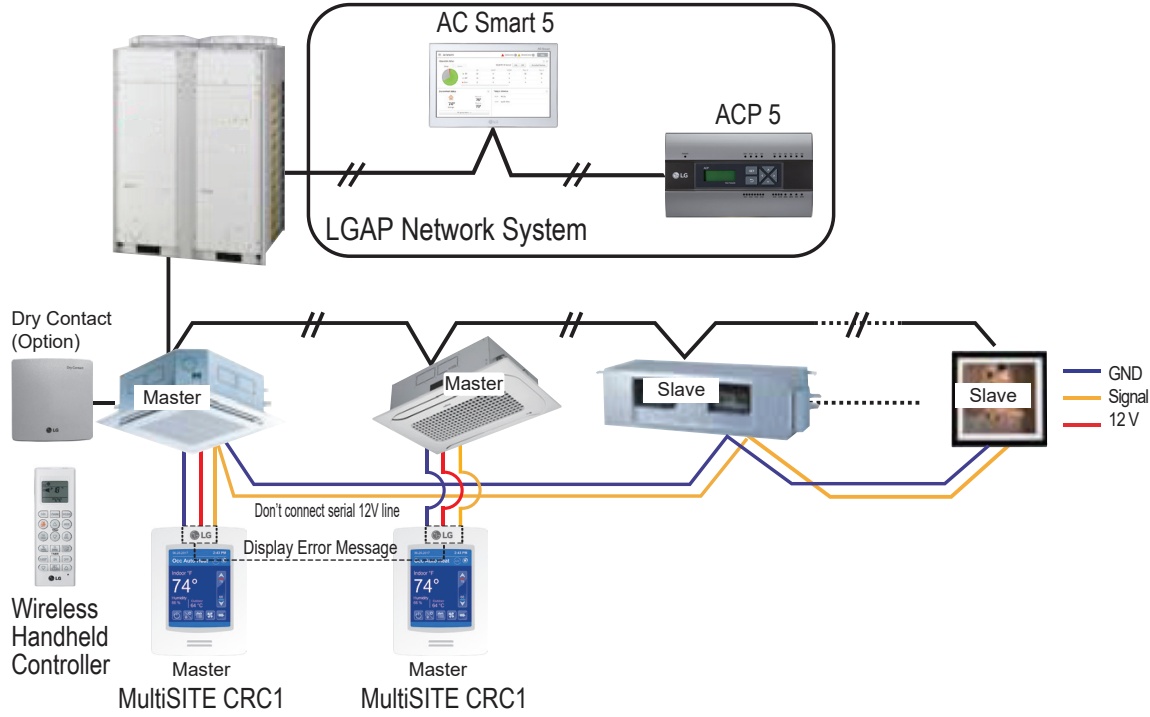
**Note:**

• Indoor Unit appearances may vary according to model.

## Group Control - Method 2

Similar to Ground Control - Method 1, but controls up to 16 indoor units with the MASTER wired remote controller (group control).

Figure 102: Group Control - Method 2, Two Wired Remote Controllers; One Configured as a Master and the Other as a Slave.



### Note:

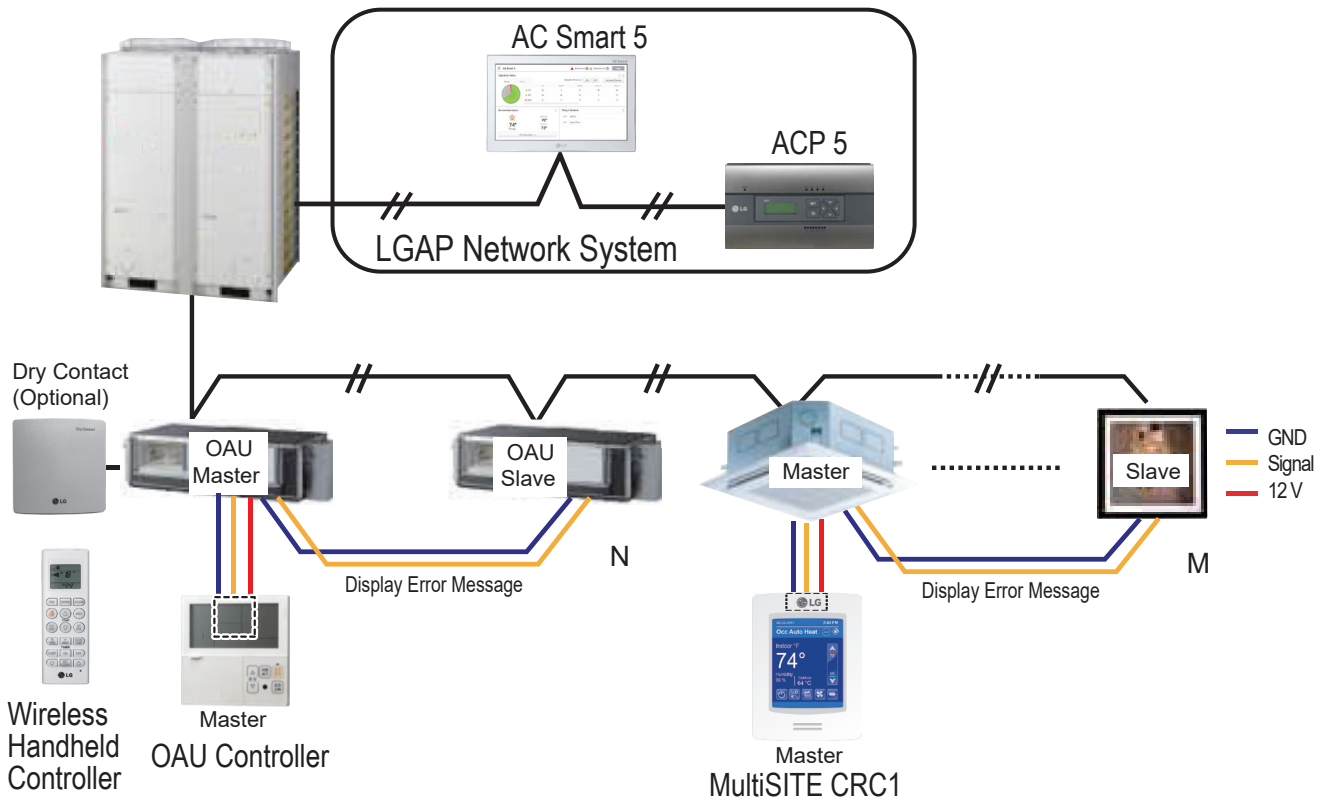
- Indoor Unit appearances may vary according to model.

Multi V Wall-Mounted Indoor Unit

**Group Control - Method 3**

Similar to Group Control - Method 1, except fresh air units and standard indoor units must be grouped separately ( $N, M \leq 16$ ) because set temperatures are different.

Figure 103: Group Control - Method 3, Standard Indoor Units and Fresh Air Units Configured as Two Groups, Each with a Master Wired Controller.



**Note:**

• Indoor Unit appearances may vary according to model.

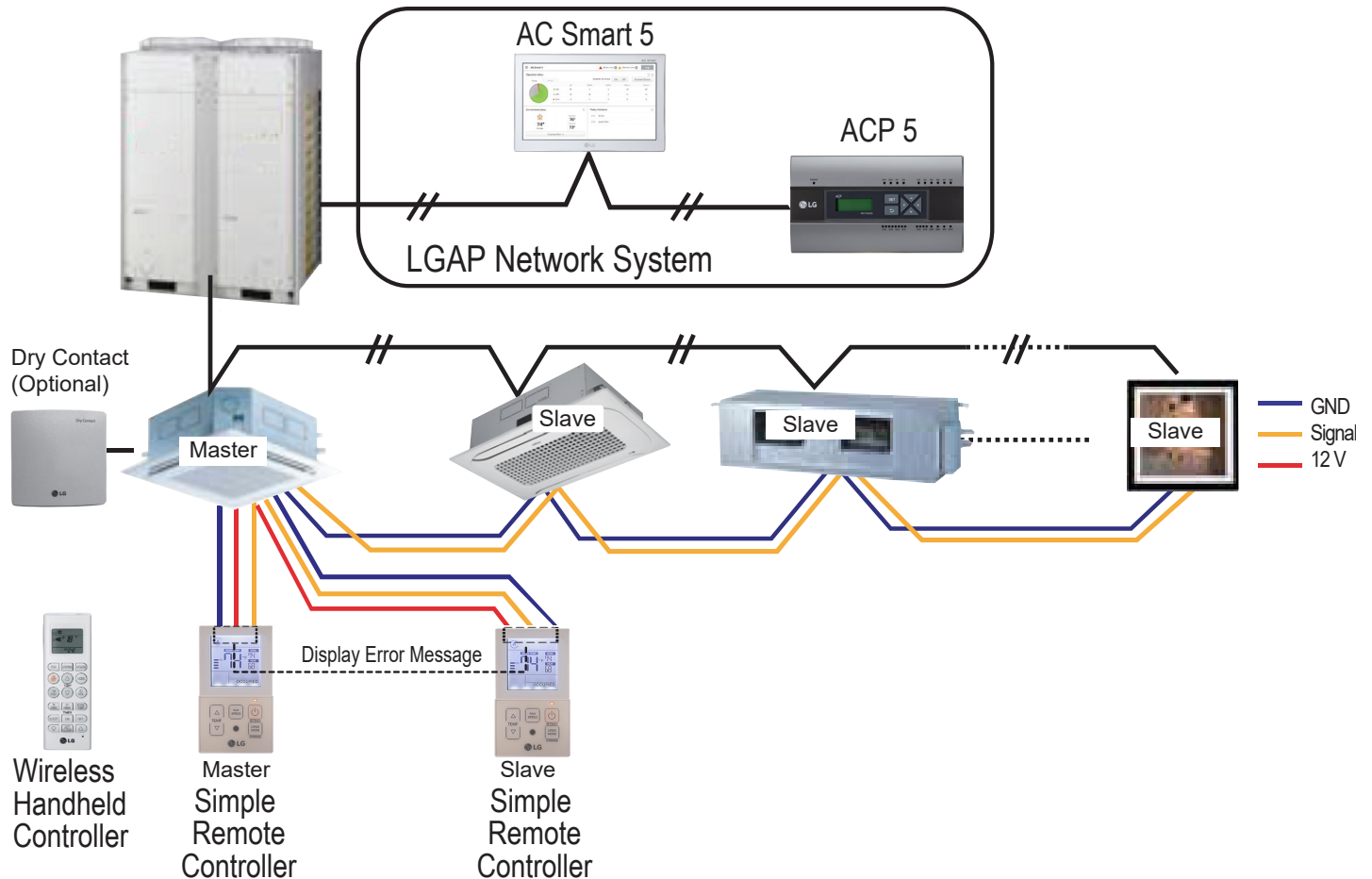
## Group Control - Method 4

### Note:

The only remote controllers that support Group Control - Method 4 are the Simple Remote Controllers.

- Two Simple Remote Controllers (maximum) are connected to one indoor unit.
- Set only one indoor unit in a group to master; set the others to slave. If master / slave(s) are not set properly in a group application, a malfunction will occur.
- Set only one Simple Remote Controller to master; set the others to slave.
- All types of indoor units can be configured in a Group Control - Method 4 configuration.
- A wireless remote controller can be used at the same time as a Simple Remote Controller.
- A dry contact and central controller can be connected at the same time (to a master indoor unit only).
- If an error occurs at an indoor unit, the error code is displayed at the Simple Remote Controller.
- Group Control - Method 4 supports all indoor unit functions.

Figure 104: Group Control - Method 4, Two Simple Remote Controllers Connected to One Indoor Unit.



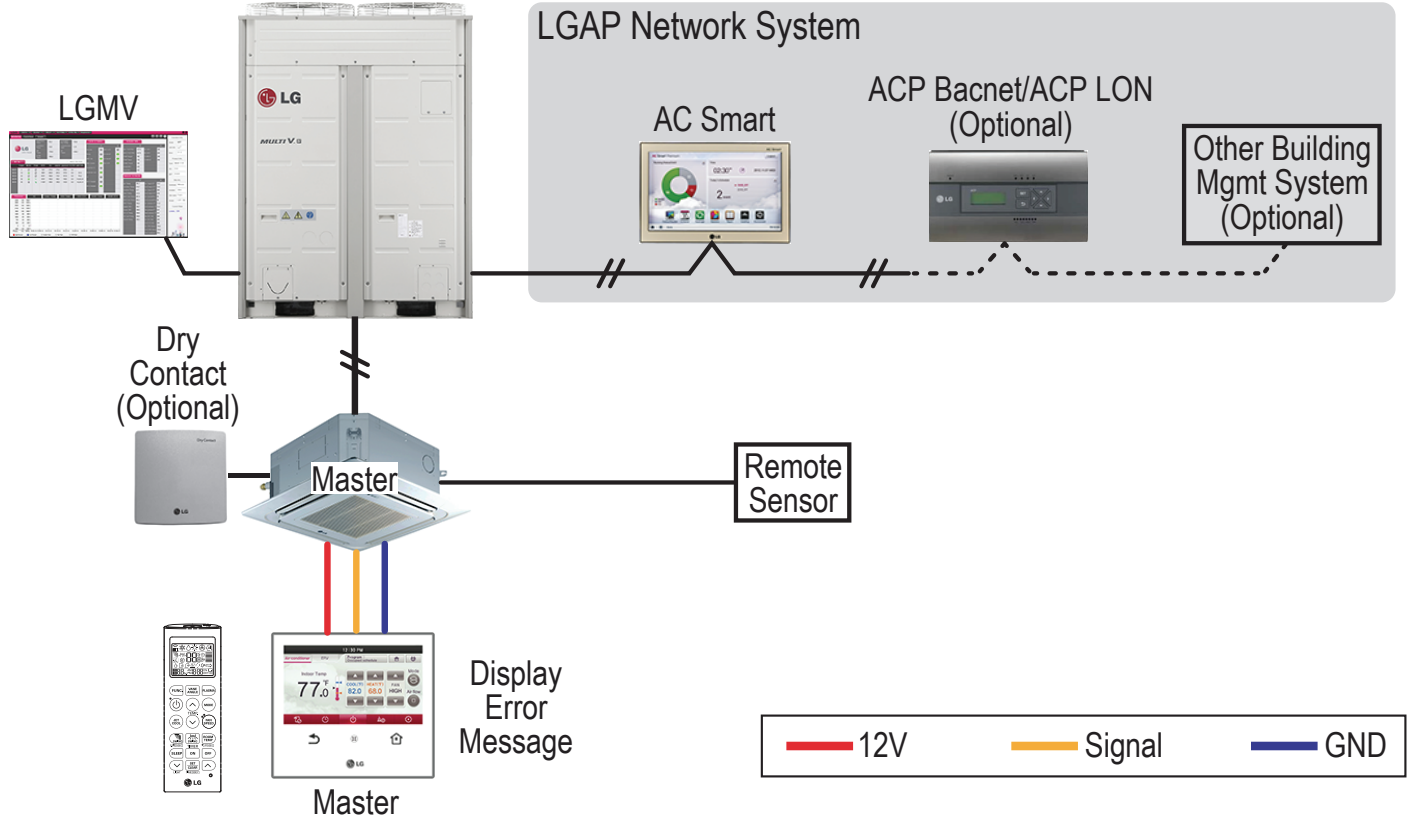
### Note:

- Indoor Unit appearances may vary according to model.

**Remote Control**

Figure below shows an example of a remote control configuration.

Figure 105: Remote Control.



**Note:**

- Indoor Unit appearances may vary according to model.

# INSTALLATION CHECKLIST



PAGE 1 of 2

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

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

## Rough-In

Description	Check
All literature and bagged accessories have been removed from the fan discharge.	
Airflow direction correct.	
Fan wheels spin without obstruction.	
Unit is properly supported – mounting bolts tight.	
Unit is level (condensate pump installations).	
Unit is canted toward gravity drain pan nipple (gravity drain installations only).	
Required minimum service clearances followed.	
Air filter is clean and properly installed.	
Does local code require a secondary drain pan under the indoor unit? Is a secondary drain line connected to the pan?	

## Duct Work

Description	Check
All seams sealed – no air leaks.	
Duct work is properly sized considering the available external static pressure rating of the indoor unit fan.	
No kinks present in the flexible duct work. Duct work is properly supported.	
Duct work balancing dampers have been installed and are correctly adjusted or open.	
Grilles and registers are properly sized and installed.	

## Refrigerant Piping

Description	Check
A medical grade dry nitrogen purge rate of 3 psig was maintained during all brazing activity.	
The back side of all flares were lubricated with a small drop of PVE refrigeration oil before tightening flare fittings (POE type was NOT used).	
All field made flares are 45°. Use factory-supplied flare nuts only.	
A torque wrench and backup wrench were used to tighten all flare connections.	
Refrigerant pipe is properly SUPPORTED to keep lateral pressure off unit connections.	
(Optional) High quality R-410A rated full port ball valves (Schrader between the valve body and the indoor units) used at all indoor units and at will in the refrigerant piping network.	
(Optional) Shutoff valves have the same internal pipe diameter as the connected pipe.	
(Optional) Two shutoff valves were installed; one (1) high pressure liquid, one (1) low pressure vapor.	

## Condensate Pump / Drain Installation

Description	Check
Condensate pipe is properly sized, supported to keep lateral pressure off connections, and insulated using LG recommendations.	
Condensate pipe horizontal segments are sloped a minimum of 1/4"/100' of pipe away from the indoor unit.	
Indoor units with condensate pumps were level. Pumped condensate drain lines were properly connected (⊘ do not have traps, and connect to the top surface of the main drain line).	
(Optional) Field-provided condensate line check valve was installed in the condensate pipe riser.	
All condensate vertical risers are equal to or less than 27-1/2 inches from the bottom of the indoor unit.	
Condensate pump riser intersects the building main drain using an inverted trap with connection to the top half of the drain line with no more of a ±45° of vertical.	
If required by local code, is a secondary high level condensate shutoff switch present / wired properly (factory provided internal high level float switch will shut down cooling operation if high water level in the pan is detected)?	

## Insulation

Description	Check
Additional housing, refrigerant, and condensate pipe insulation has been supplemented to prevent sweating while operating if indoor unit installed in abnormal environmental conditions. (Optional - job condition specific.)	
All refrigerant pipes and valves were insulated separately. Insulation is positioned up against the walls of the indoor units. All insulation seams and joints are airtight with no gaps shown. Insulation is not compressed at any point. Double layer insulation is provided at pipe supports and wall penetrations.	

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

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

### Power Wiring / Communications Cable

Description	Check
Power provided is single phase, $\pm 10\%$ of indoor unit nameplate specifications.	
Power wiring to each indoor unit was installed per all local, state, and NEC requirements. Indoor unit is properly grounded.	
Power wiring / communication cables from the outdoor unit to the indoor unit(s) / heat recovery unit(s) (heat recovery systems only) are connected to the proper terminals. See wiring diagrams for each indoor unit / heat recovery unit model.	
Power wiring and communication cables were properly separated using at least the required minimum distances provided in the product installation manual.	
Cables are installed using at least the required minimum distances from high voltage and EMF generating equipment.	
All terminal block screws are tight. Power wiring is not in contact with communication terminals. Power wiring / communication cables have ring or fork terminals installed (use appropriate crimping tool to attach).	
Power wiring and communication cables are properly secured to the control panel case to prevent wire tension at the terminal block.	
Power wiring and communication cables are protected from chaffing and sharp edges at control box case and conduit pipe openings.	
Communication cable between Master ODU to Slave ODU(s), and Master ODU to IDUs / HRUs to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Master ODU chassis only. Cable segment shields are tied together.	
Communications cable is plenum rated.	
Ground wire was installed and properly terminated at the outdoor unit(s).	
(Optional) Smoke detector is properly installed and wired. New batteries are installed (if applicable).	

### Wall Mounted Zone Controller Communications

Description	Check
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.	
Zone controller cable has not been cut, spliced, or extended with wire nuts.	
Cable is securely plugged into the socket on the zone controller or the three screw terminals (controller model specific); Yellow to "Y", Red to "R", and Black to "B".	
Zone controller field settings have been adjusted for the application's space temperature sensing strategy.	

### Indoor Unit Control Panel

Description	Check
Zone controller cable is securely connected to the indoor unit PCB.	
If an optional remote temperature sensor was installed, the associated cable is plugged into the proper socket (the factory return air thermistor has been unplugged).	
Indoor unit DIP switches have been adjusted for application (group control-master / slave; continuous fan operation; dry contact).	
All plugs are properly seated in the sockets on the control board.	
Power and communications cables are properly restrained and separated.	



*Inverter*



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IM\_MultiV\_Wall\_Mounted\_10\_19  
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IM\_MultiV\_IV\_Wall\_Mounted\_04\_16