

MULTI V™

CEILING CASSETTE INDOOR UNIT INSTALLATION MANUAL

One-Way Models

- ARNU073TUD4
- ARNU093TUD4
- ARNU123TUD4
- ARNU183TTD4
- ARNU243TTD4



Two-Way Models

- ARNU183TSA4
- ARNU243TSA4



Four-Way 2' x 2' Models

- ARNU053TRD4
- ARNU073TRD4
- ARNU093TRD4
- ARNU123TRD4
- ARNU153TQD4
- ARNU183TQD4



Four-Way 3' x 3' Models

- ARNU073TNA4
- ARNU093TNA4
- ARNU123TNA4
- ARNU153TNA4
- ARNU183TNA4
- ARNU243TNA4
- ARNU283TMA4
- ARNU363TMA4
- ARNU423TMC4
- ARNU483TMC4



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For more technical materials such as submittals, catalogs, engineering, installation, best practices, and owner's manuals, visit 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

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

INSTALLATION

DANGER

Do not 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 or 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 an authorized 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.

 **Do not 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.

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.

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.

⚠ 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.

⚠ 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.

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.

⊘ Do not open the inlet grille of the unit during operation.

⊘ Do not operate the unit with the panels or guards removed. ⊘ Do not open the inlet grille of the unit during operation. ⊘ 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.

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.

⊘ 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.

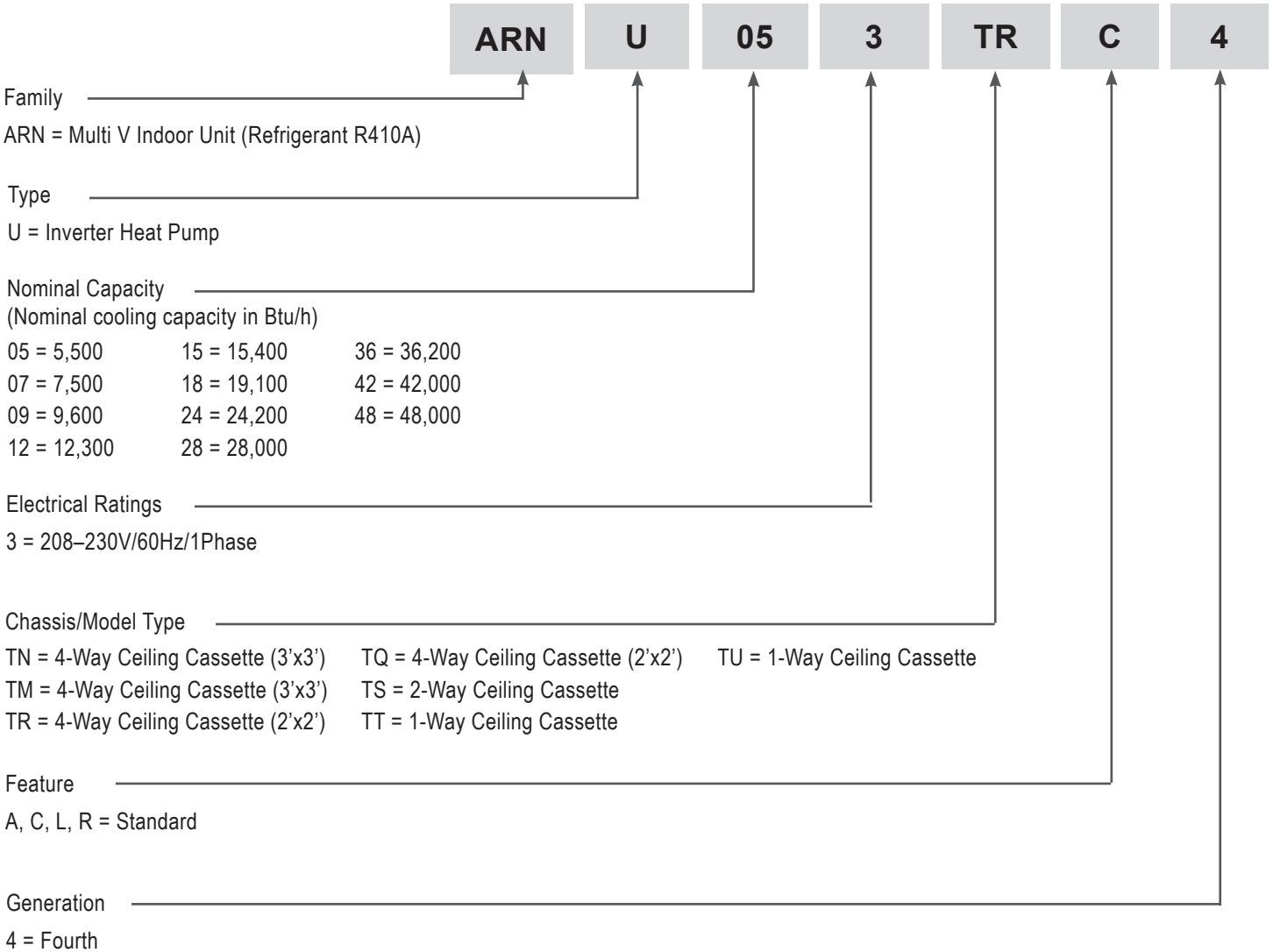
If the base collapses, the unit could fall and cause property damage or product failure.

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

There is risk of unit failure.

Cassette Indoor Units Nomenclature


MULTI V Ceiling Cassette Indoor Units



Ceiling Cassette Indoor Units

This manual describes how to install the LG One-Way, Two-Way, and Four-Way Ceiling Cassette indoor units (IDU) for Multi V Variable Refrigerant Flow (VRF) heat pump and heat recovery systems. The table on the next page lists the available models. Refer to LG's Multi V Ceiling Cassette Indoor Unit Engineering Manual for complete detailed engineering data and selection procedures.

Safety

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

Installation Personnel

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

⚠ WARNING

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

Note:

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

Required Tools (field provided)

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

Required Parts (field provided)

- Connecting cable (power and control)
- Pipes - vapor line and liquid line, with insulation
- 3/8" or 1/2" Threaded hanger rods
- 3/8" or 1/2" nuts, flat washers, and lock/split washers
- Insulated drain hose
- Additional drain hose

Figure 1: One-Way TU, TT Frame.

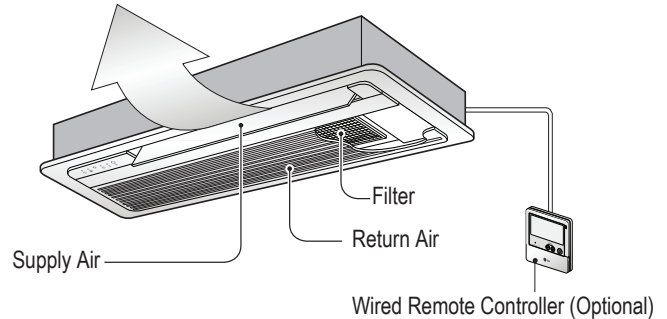


Figure 2: Two-Way TS Frame.

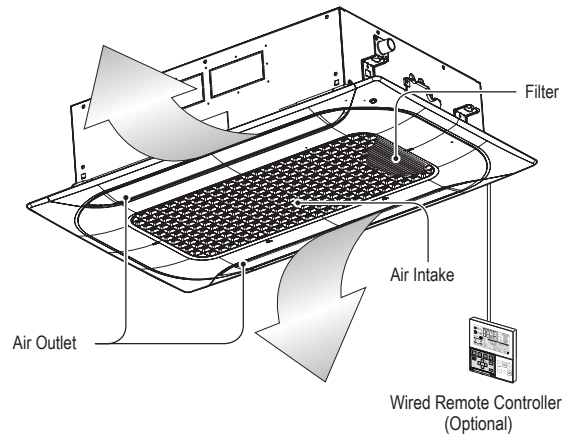
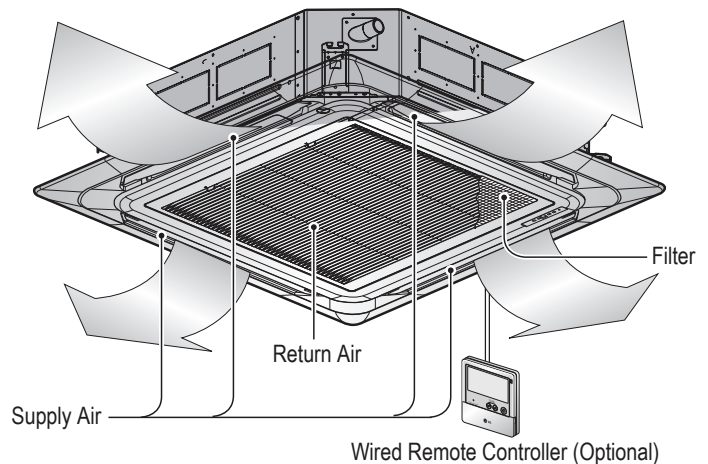


Figure 3: Four-Way TQ, TR, TM, TN Frame.



Included Parts (Depends on Model)

Table 1: Included Items.


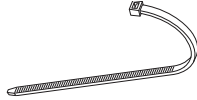


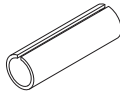

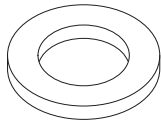
Part	Quantity	Image	Part	Quantity	Image
Drain Hose	One (1)		Cable Ties	Four (4)	
Metal Clamp	Two (2)		Conduit Bracket (Appearances Will Vary Depending on Model)	One (1)	
Insulation for Fittings	One (1) Set	  For Vapor Piping For Liquid Piping	Washers for Hanging Bracket	Eight (8)	
Paper Pattern for Installation	One (1)				

Table 2: Required Accessory Table (Sold Separately).

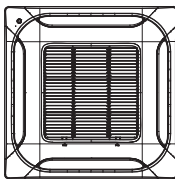
Part	Quantity	Image
Four-Way Ceiling Cassette Grille Kit (PT-QCHW0 or PT-UQC [2x2]; or PT-UMC1 [3x3])	One (1)	

Table 3: Multi V Cassette Indoor Units.

Unit	Model Number
<p>Ceiling Cassette One-Way</p> 	ARNU073TUD4
	ARNU093TUD4
	ARNU123TUD4
	ARNU183TTD4
	ARNU243TTD4
<p>Ceiling Cassette: Two-Way</p> 	ARNU183TSA4
	ARNU243TSA4
<p>Ceiling Cassette: Four-Way (2' x 2')</p> 	ARNU053TRD4
	ARNU073TRD4
	ARNU093TRD4
	ARNU123TRD4
	ARNU153TQD4
	ARNU183TQD4
<p>Ceiling Cassette: Four-Way (3' x 3')</p> 	ARNU073TNA4
	ARNU093TNA4
	ARNU123TNA4
	ARNU153TNA4
	ARNU183TNA4
	ARNU243TNA4
	ARNU283TMA4
	ARNU363TMA4
	ARNU423TMC4
ARNU483TMC4	

R410A Refrigerant

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

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

WARNING

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

Note:



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

Table 4: One-Way Ceiling Cassette (TU and TT Frames) Indoor Unit General Data.

Model No.	ARNU073TUD4	ARNU093TUD4	ARNU123TUD4	ARNU183TTD4	ARNU243TTD4
Cooling Mode Performance					
Capacity (Btu/h)	7,500	9,600	12,300	19,100	24,200
Max. Power Input ¹ (W)	40	40	40	70	70
L/M/H Power Input at Factory Default (W)	16 / 18 / 20	18 / 20 / 22	20 / 22 / 24	24 / 28 / 38	26 / 33 / 51
Heating Mode Performance					
Capacity (Btu/h)	8,500	10,900	13,600	21,500	24,200
Max. Power Input ¹ (W)	40	40	40	70	70
L/M/H Power Input at Factory Default (W)	16 / 18 / 20	18 / 20 / 22	20 / 22 / 24	24 / 28 / 38	26 / 33 / 51
Entering Mixed Air					
Cooling Max (°F WB)	76	76	76	76	76
Heating Min (°F DB)	59	59	59	59	59
Unit Data					
Refrigerant Type ²	R410A	R410A	R410A	R410A	R410A
Refrigerant Control	EEV	EEV	EEV	EEV	EEV
Sound Pressure ³ dB(A) (H/M/L)	32 / 29 / 25	35 / 34 / 32	38 / 35 / 32	40 / 37 / 35	43 / 40 / 36
Net Unit Weight (lbs.)	33	33	33	42	42
Shipping Weight (lbs.)	40	40	40	49	49
Grille Weight (lbs)	10	10	10	13	13
Grille Shipping Weight (lbs)	16	16	16	20	20
Communication Cable ⁴ (No. x AWG)	2 x 18	2 x 18	2 x 18	2 x 18	2 x 18
Fan					
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)	290 / 258 / 226	325 / 304 / 290	353 / 325 / 290	470 / 427 / 385	515 / 470 / 406
Piping					
Liquid Line (in., O.D.)	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	5/8 Flare
Condensate Line (in., I.D.)	1	1	1	1	1

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes. See page 19 for detailed electrical data.

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.

¹Max. power input is rated at maximum setting value.

²Take 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.

³Sound Pressure levels are tested in an anechoic chamber under ISO Standard 3745.

⁴Communication 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.

GENERAL DATA



Specifications

Table 5: Two-Way Ceiling Cassette (TS Frames) Indoor Unit General Data.

Model No.	ARNU183TSA4	ARNU243TSA4
Cooling Mode Performance		
Capacity (Btu/h)	19,100	24,200
Max. Power Input ¹ (W)	70	70
L/M/H Power Input at Factory Default (W)	24 / 29 / 34	25 / 30 / 40
Heating Mode Performance		
Capacity (Btu/h)	21,500	27,300
Max. Power Input ¹ (W)	70	70
L/M/H Power Input at Factory Default (W)	24 / 29 / 34	25 / 30 / 40
Entering Mixed Air		
Cooling Max (°F WB)	76	76
Heating Min (°F DB)	59	59
Unit Data		
Refrigerant Type ²	R410A	R410A
Refrigerant Control	EEV	EEV
Sound Pressure ³ dB(A) (H/M/L)	35 / 33 / 31	40 / 37 / 33
Net Unit Weight (lbs.)	39.9	39.9
Shipping Weight (lbs.)	49.6	49.6
Grille Weight (lbs)	10.3	10.3
Grille Shipping Weight (lbs)	14.3	14.3
Communication Cable ⁴ (No. x AWG)	2 x 18	2 x 18
Fan		
Type	Turbo Fan	Turbo Fan
Quantity	1	1
Motor/Drive	Brushless Digitally Controlled / Direct	
Airflow Rate H/M/L (CFM)	459 / 424 / 353	601 / 530 / 459
Piping		
Liquid Line (in., O.D.)	1/4 Flare	3/8 Flare
Vapor Line (in., O.D.)	1/2 Flare	5/8 Flare
Condensate Line (in., I.D.)	1	1

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes. See page 19 for detailed electrical data.

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.

¹Max. power input is rated at maximum setting value.

²Take 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.

³Sound Pressure levels are tested in an anechoic chamber under ISO Standard 3745.

⁴Communication 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.

MULTI V Ceiling Cassette Indoor Units

Table 6: Four-Way Ceiling Cassette (2' x 2' TR and TQ Frames) Indoor Unit General Data.

Model No.	ARNU053TRD4	ARNU073TRD4	ARNU093TRD4	ARNU123TRD4	ARNU153TQD4	ARNU183TQD4
Cooling Mode Performance						
Capacity (Btu/h)	5,500	7,500	9,600	12,300	15,400	19,100
Max. Power Input ¹ (W)	30	30	30	30	30	30
L/M/H Power Input at Factory Default (W)	11 / 12 / 13	11 / 12 / 13	12 / 13 / 14	13 / 15 / 17	18 / 21 / 24	19 / 22 / 25
Heating Mode Performance						
Capacity (Btu/h)	6,100	8,500	10,900	13,600	17,100	21,500
Max. Power Input ¹ (W)	30	30	30	30	30	30
L/M/H Power Input at Factory Default (W)	11 / 12 / 13	11 / 12 / 13	12 / 13 / 14	13 / 15 / 17	18 / 21 / 24	19 / 22 / 25
Entering Mixed Air						
Cooling Max. (°F WB)	76	76	76	76	76	76
Heating Min. (°F DB)	59	59	59	59	59	59
Unit Data						
Refrigerant Type ²	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant Control	EEV	EEV	EEV	EEV	EEV	EEV
Sound Pressure ³ dB(A) (H/M/L)	29 / 27 / 26	29 / 27 / 26	30 / 29 / 27	32 / 30 / 27	36 / 34 / 32	37 / 35 / 34
Net Unit Weight (lbs.)	29	29	32	32	35	35
Shipping Weight (lbs.)	34	34	38	38	40	40
Grille Weight (lbs)	7	7	7	7	7	7
Grille Shipping Weight (lbs)	9	9	9	9	9	9
Communication Cable ⁴ (No. x AWG)	2 x 18	2 x 18	2 x 18	2 x 18	2 x 18	2 x 18
Fan						
Type	Turbo	Turbo	Turbo	Turbo	Turbo	Turbo
Quantity	1	1	1	1	1	1
Motor/Drive	Brushless Digitally Controlled / Direct					
Airflow Rate H/M/L (CFM)	265 / 247 / 212	265 / 247 / 212	283 / 265 / 251	307 / 283 / 247	388 / 353 / 328	396 / 388 / 353
Piping						
Liquid Line (in., O.D.)	1/4 Flare	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	1/2 Flare
Condensate Line (in., I.D.)	1	1	1	1	1	1

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes. See page 19 for detailed electrical data.

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.

¹Max. power input is rated at maximum setting value.

²Take 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.

³Sound Pressure levels are tested in an anechoic chamber under ISO Standard 3745.

⁴Communication 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.

GENERAL DATA



Specifications

Table 7: Four-Way Ceiling Cassette (3' x 3' TN Frames) Indoor Unit General Data.

Model No.	ARNU073TNA4	ARNU093TNA4	ARNU123TNA4	ARNU153TNA4
Cooling Mode Performance				
Capacity (Btu/h)	7,500	9,600	12,300	15,400
Max. Power Input ¹ (W)	144	144	144	144
L/M/H Power Input at Factory Default (W)	12 / 15 / 18	12 / 15 / 19	14 / 17 / 22	14 / 17 / 25
Heating Mode Performance				
Capacity (Btu/h)	8,500	10,900	13,600	17,100
Max. Power Input ¹ (W)	144	144	144	144
L/M/H Power Input at Factory Default (W)	12 / 15 / 18	12 / 15 / 19	14 / 17 / 22	14 / 17 / 25
Entering Mixed Air				
Cooling Max (°F WB)	76	76	76	76
Heating Min (°F DB)	59	59	59	59
Unit Data				
Refrigerant Type ²	R410A	R410A	R410A	R410A
Refrigerant Control	EEV	EEV	EEV	EEV
Sound Pressure ³ dB(A) (H/M/L)	29 / 26 / 24	29 / 26 / 24	31 / 29 / 26	32 / 29 / 26
Net Unit Weight (lbs.)	53.6	53.6	53.6	53.6
Shipping Weight (lbs.)	66.1	66.1	66.1	66.1
Grille Weight (lbs)	14	14	14	14
Grille Shipping Weight (lbs)	21	21	21	21
Communication Cable ⁴ (No. x AWG)	2 x 18	2 x 18	2 x 18	2 x 18
Fan				
Type	Turbo	Turbo	Turbo	Turbo
Quantity	1	1	1	1
Motor/Drive	Brushless Digitally Controlled / Direct			
Airflow Rate H/M/L (CFM)	459 / 424 / 388	477 / 424 / 388	494 / 459 / 424	530 / 459 / 424
Piping				
Liquid Line (in., O.D.)	3/8 Flare	3/8 Flare	3/8 Flare	3/8 Flare
Vapor Line (in., O.D.)	5/8 Flare	5/8 Flare	5/8 Flare	5/8 Flare
Condensate Line (in., I.D.)	1	1	1	1

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes. See page 19 for detailed electrical data.

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.ahrirectory.org.

¹Max. power input is rated at maximum setting value.

²Take 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.

³Sound Pressure levels are tested in an anechoic chamber under ISO Standard 3745.

⁴Communication 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.

Table 8: Four-Way Ceiling Cassette (3' x 3' TN Frames) Indoor Unit General Data, continued.

Model No.	ARNU183TNA4	ARNU243TNA4
Cooling Mode Performance		
Capacity (Btu/h)	19,100	24,200
Max. Power Input ¹ (W)	144	144
L/M/H Power Input at Factory Default (W)	14 / 18 / 27	30 / 38 / 51
Heating Mode Performance		
Capacity (Btu/h)	21,500	27,300
Max. Power Input ¹ (W)	144	144
L/M/H Power Input at Factory Default (W)	14 / 18 / 27	30 / 38 / 51
Entering Mixed Air		
Cooling Max (°F WB)	76	76
Heating Min (°F DB)	59	59
Unit Data		
Refrigerant Type ²	R410A	R410A
Refrigerant Control	EEV	EEV
Sound Pressure ³ dB(A) (H/M/L)	34 / 30 / 26	40 / 38 / 35
Net Unit Weight (lbs.)	53.6	53.6
Shipping Weight (lbs.)	66.1	66.1
Grille Weight (lbs)	14	14
Grille Shipping Weight (lbs)	21	21
Communication Cable ⁴ (No. x AWG)	2 x 18	2 x 18
Fan		
Type	Turbo	Turbo
Quantity	1	1
Motor/Drive	Brushless Digitally Controlled / Direct	
Airflow Rate H/M/L (CFM)	565 / 530 / 424	742 / 671 / 600
Piping		
Liquid Line (in., O.D.)	3/8 Flare	3/8 Flare
Vapor Line (in., O.D.)	5/8 Flare	5/8 Flare
Condensate Line (in., I.D.)	1	1

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes. See page 19 for detailed electrical data.

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.ahrirectory.org.

¹Max. power input is rated at maximum setting value.

²Take 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.

³Sound Pressure levels are tested in an anechoic chamber under ISO Standard 3745.

⁴Communication 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.

GENERAL DATA



Specifications

Table 9: Four-Way Ceiling Cassette (3' x 3' TM Frames) Indoor Unit General Data.

Model No.	ARNU283TMA4	ARNU363TMA4	ARNU423TMC4	ARNU483TMC4
Cooling Mode Performance				
Capacity (Btu/h)	28,000	36,200	42,000	48,100
Max. Power Input ¹ (W)	144	144	144	144
L/M/H Power Input at Factory Default (W)	31 / 43 / 52	34 / 47 / 64	53 / 75 / 104	66 / 80 / 120
Heating Mode Performance				
Capacity (Btu/h)	31,500	40,600	43,800	51,200
Max. Power Input ¹ (W)	144	144	144	144
L/M/H Power Input at Factory Default (W)	31 / 43 / 52	34 / 47 / 64	53 / 75 / 104	66 / 80 / 120
Entering Mixed Air				
Cooling Max (°F WB)	76	76	76	76
Heating Min (°F DB)	59	59	59	59
Unit Data				
Refrigerant Type ²	R410A	R410A	R410A	R410A
Refrigerant Control	EEV	EEV	EEV	EEV
Sound Pressure ³ dB(A) (H/M/L)	41 / 39 / 35	44 / 41 / 37	45 / 41 / 38	46 / 42 / 40
Net Unit Weight (lbs.)	58.4	58.4	59	59
Shipping Weight (lbs.)	70.5	70.5	69	69
Grille Weight (lbs)	14	14	14	14
Grille Shipping Weight (lbs)	21	21	21	21
Communication Cable ⁴ (No. x AWG)	2 x 18	2 x 18	2 x 18	2 x 18
Fan				
Type	Turbo	Turbo	Turbo	Turbo
Quantity	1	1	1	1
Motor/Drive	Brushless Digitally Controlled / Direct			
Airflow Rate H/M/L (CFM)	812 / 741 / 635	918 / 812 / 706	1,059 / 918 / 812	1,130 / 953 / 883
Piping				
Liquid Line (in., O.D.)	3/8 Flare	3/8 Flare	3/8 Flare	3/8 Flare
Vapor Line (in., O.D.)	5/8 Flare	5/8 Flare	5/8 Flare	5/8 Flare
Condensate Line (in., I.D.)	1	1	1	1

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes. See page 19 for detailed electrical data.

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.ahrirectory.org.

¹Max. power input is rated at maximum setting value.

²Take 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.

³Sound Pressure levels are tested in an anechoic chamber under ISO Standard 3745.

⁴Communication 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.

Electrical Data

Table 10: Ceiling Cassette Indoor Units Electrical Data.

Model	Voltage Range	MCA (A)	MOP (A)	Rated Amps (A)	Power Supply			Power Input (W)		
					Hz	Volts	Phase	Max. Cooling	Max. Heating	L / M / H at Factory Default
One-Way Ceiling Cassette Indoor Units										
ARNU073TUD4	187-253	0.23	15	0.18	60	208-230	1	40	40	16 / 18 / 20
ARNU093TUD4		0.23		0.18				40	40	18 / 20 / 22
ARNU123TUD4		0.23		0.18				40	40	20 / 22 / 24
ARNU183TTD4		0.38		0.30				70	70	24 / 28 / 38
ARNU243TTD4		0.38		0.30				70	70	26 / 33 / 51
Two-Way Ceiling Cassette Indoor Units										
ARNU183TSA4	187-253	0.84	15	0.30	60	208-230	1	70	70	24 / 29 / 34
ARNU243TSA4		0.84		0.30				70	70	25 / 30 / 40
Four-Way Ceiling Cassette (2' x 2') Indoor Units										
ARNU053TRD4	187-253	0.25	15	0.20	60	208-230	1	30	30	11 / 12 / 13
ARNU073TRD4		0.25		0.20				30	30	11 / 12 / 13
ARNU093TRD4		0.25		0.20				30	30	12 / 13 / 14
ARNU123TRD4		0.25		0.20				30	30	13 / 15 / 17
ARNU153TQD4		0.25		0.20				30	30	18 / 21 / 24
ARNU183TQD4		0.25		0.20				30	30	19 / 22 / 25
Four-Way Ceiling Cassette (3' x 3', 9-11/16" High) Indoor Units										
ARNU073TNA4	187-253	0.71	15	0.56	60	208-230	1	144	144	12 / 15 / 18
ARNU093TNA4		0.71		0.56				144	144	12 / 15 / 19
ARNU123TNA4		0.71		0.56				144	144	14 / 17 / 22
ARNU153TNA4		0.71		0.56				144	144	14 / 17 / 25
ARNU183TNA4		0.71		0.56				144	144	14 / 18 / 27
ARNU243TNA4		0.71		0.56				144	144	30 / 38 / 51
Four-Way Ceiling Cassette (3' x 3', 11-5/16" High) Indoor Units										
ARNU283TMA4	187-253	1.6	15	1.3	60	208-230	1	144	144	31 / 43 / 52
ARNU363TMA4		1.6		1.3				144	144	34 / 47 / 64
ARNU423TMC4		1.6		1.3				144	144	53 / 75 / 104
ARNU483TMC4		1.6		1.3				144	144	66 / 80 / 120

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 a fuse, use the circuit breaker.

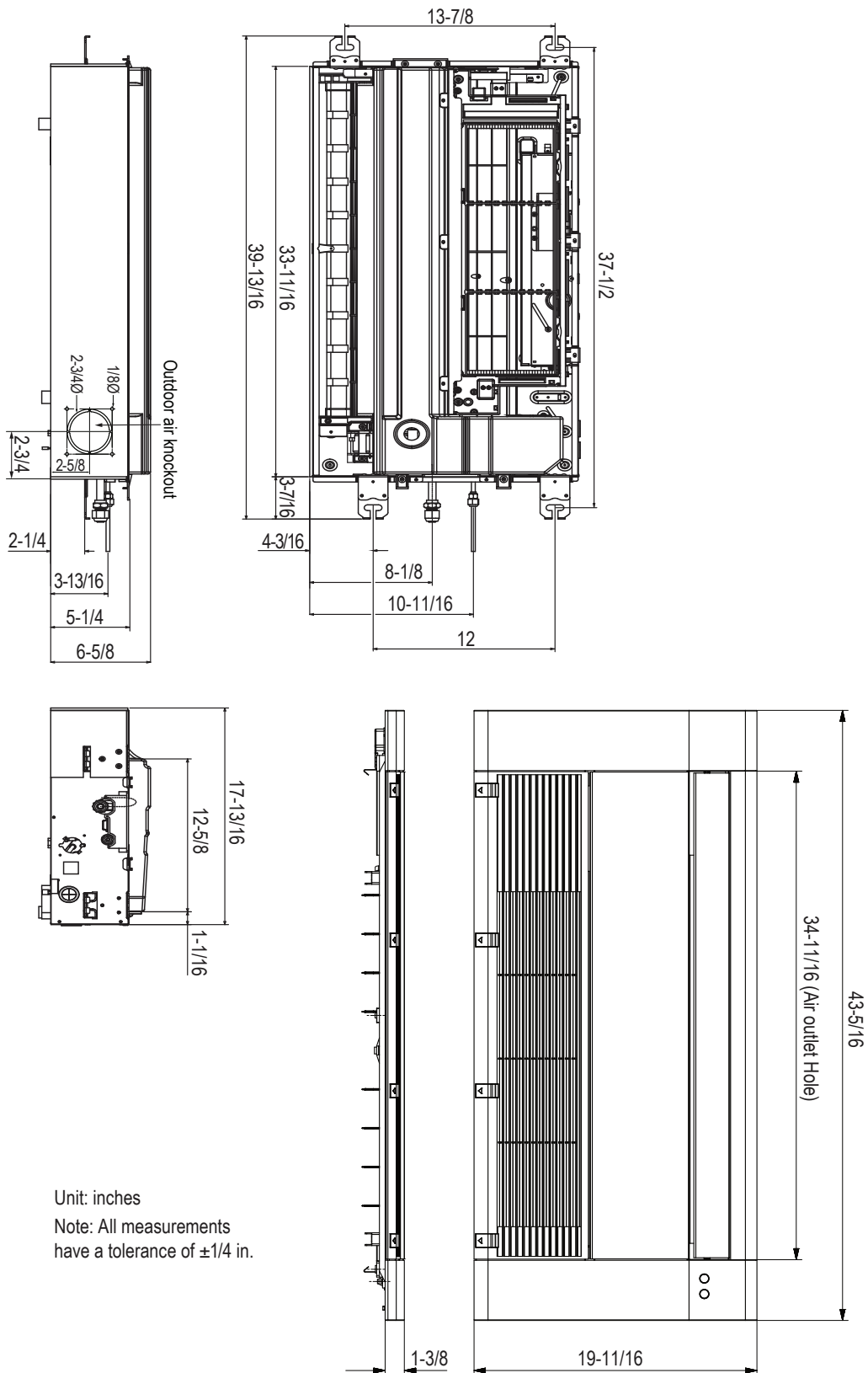
Max. power input is rated at maximum setting value.

GENERAL DATA

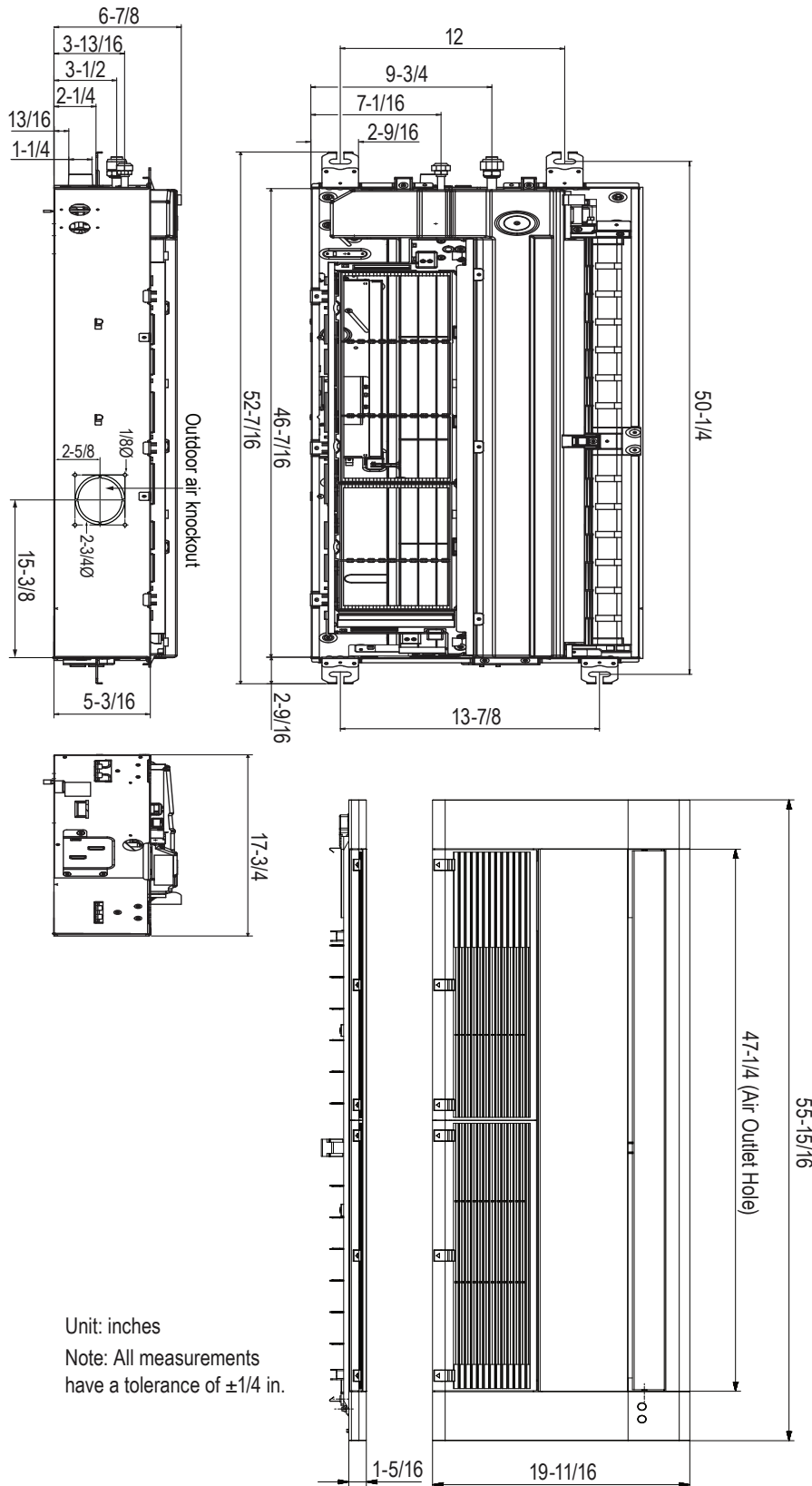


Dimensions – TU Frame with PT-UUC1 Grille

MULTI V Ceiling Cassette Indoor Units



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

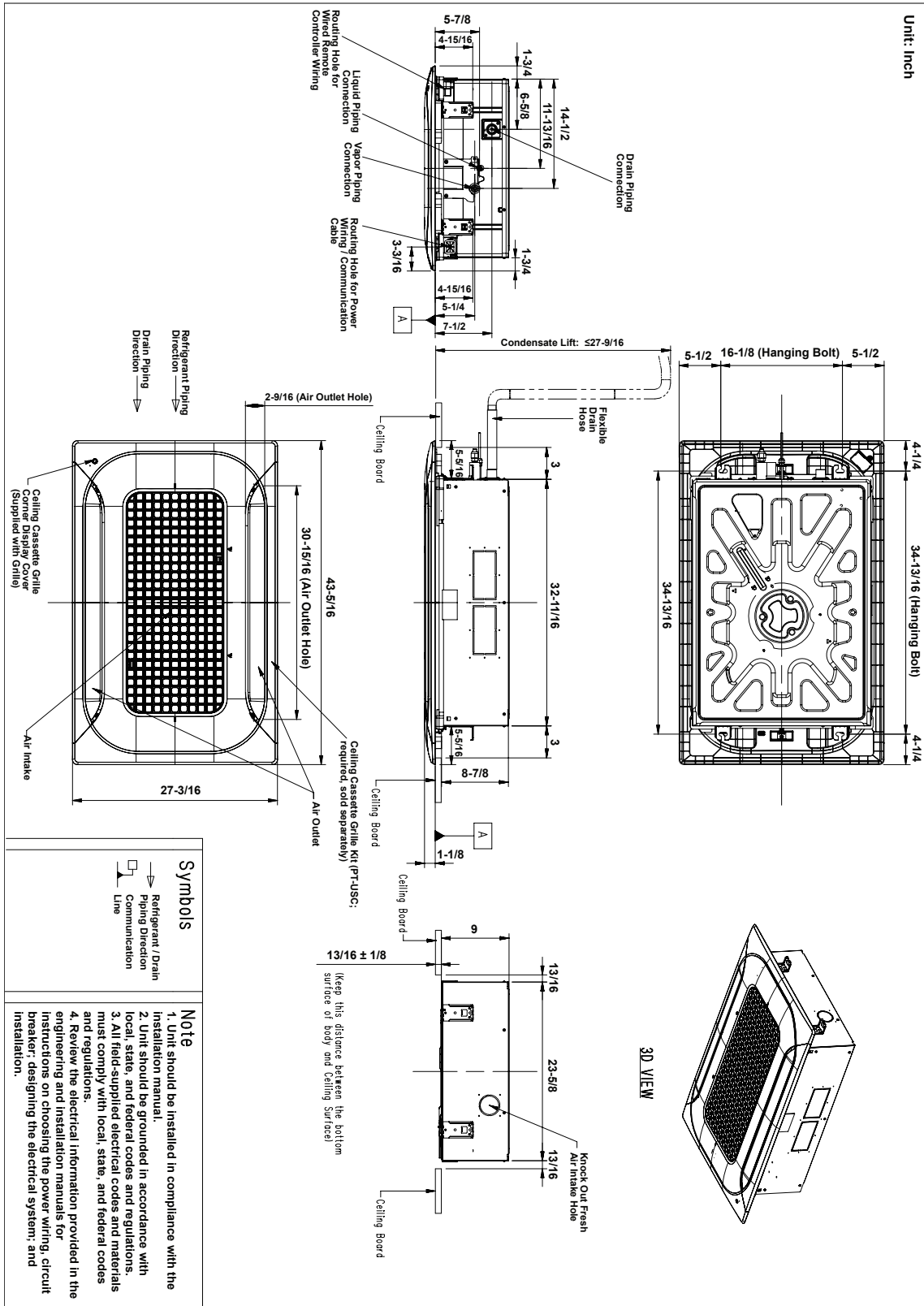


Unit: inches
 Note: All measurements have a tolerance of ±1/4 in.

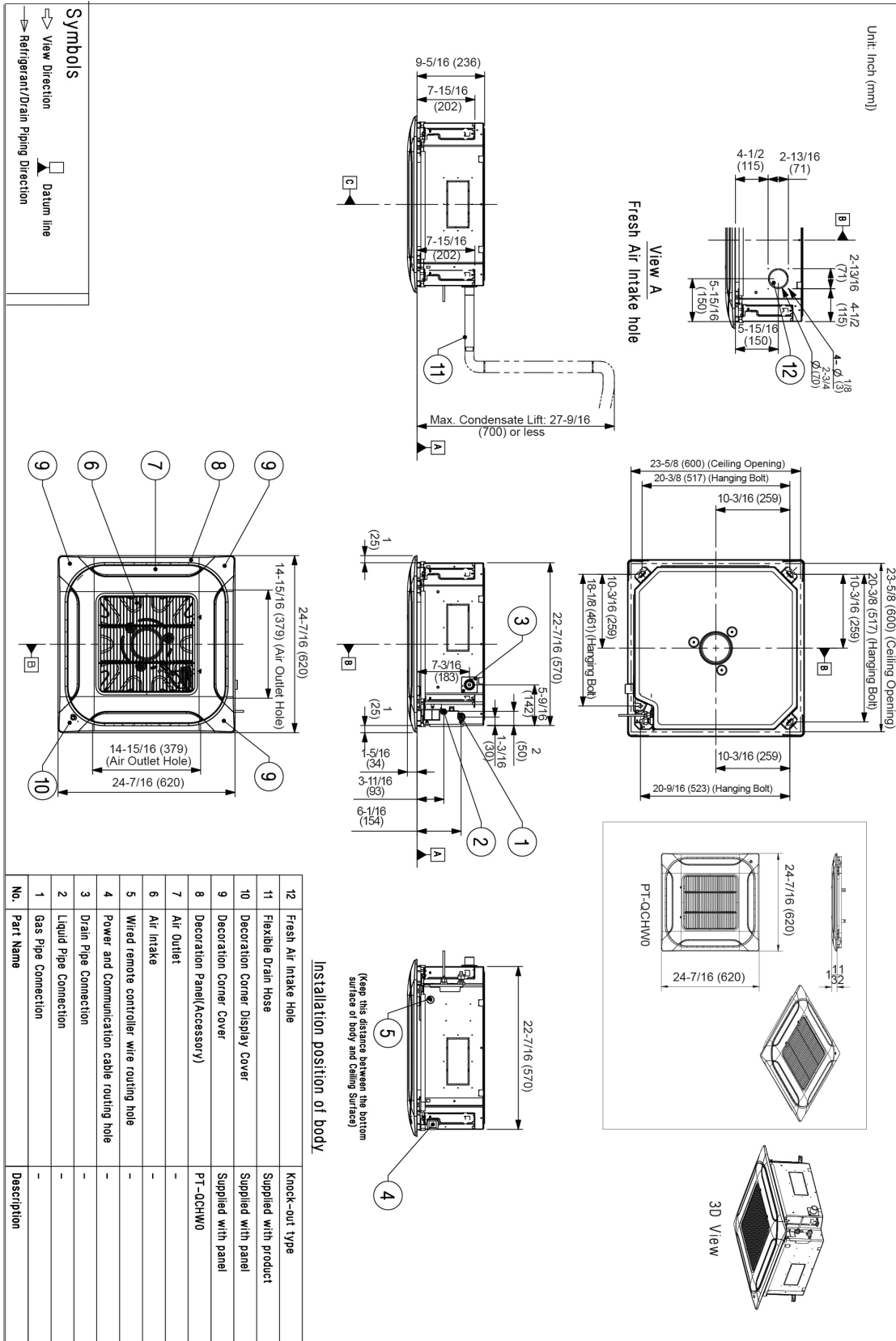
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Dimensions – TS Frame



MULTI V Ceiling Cassette Indoor Units

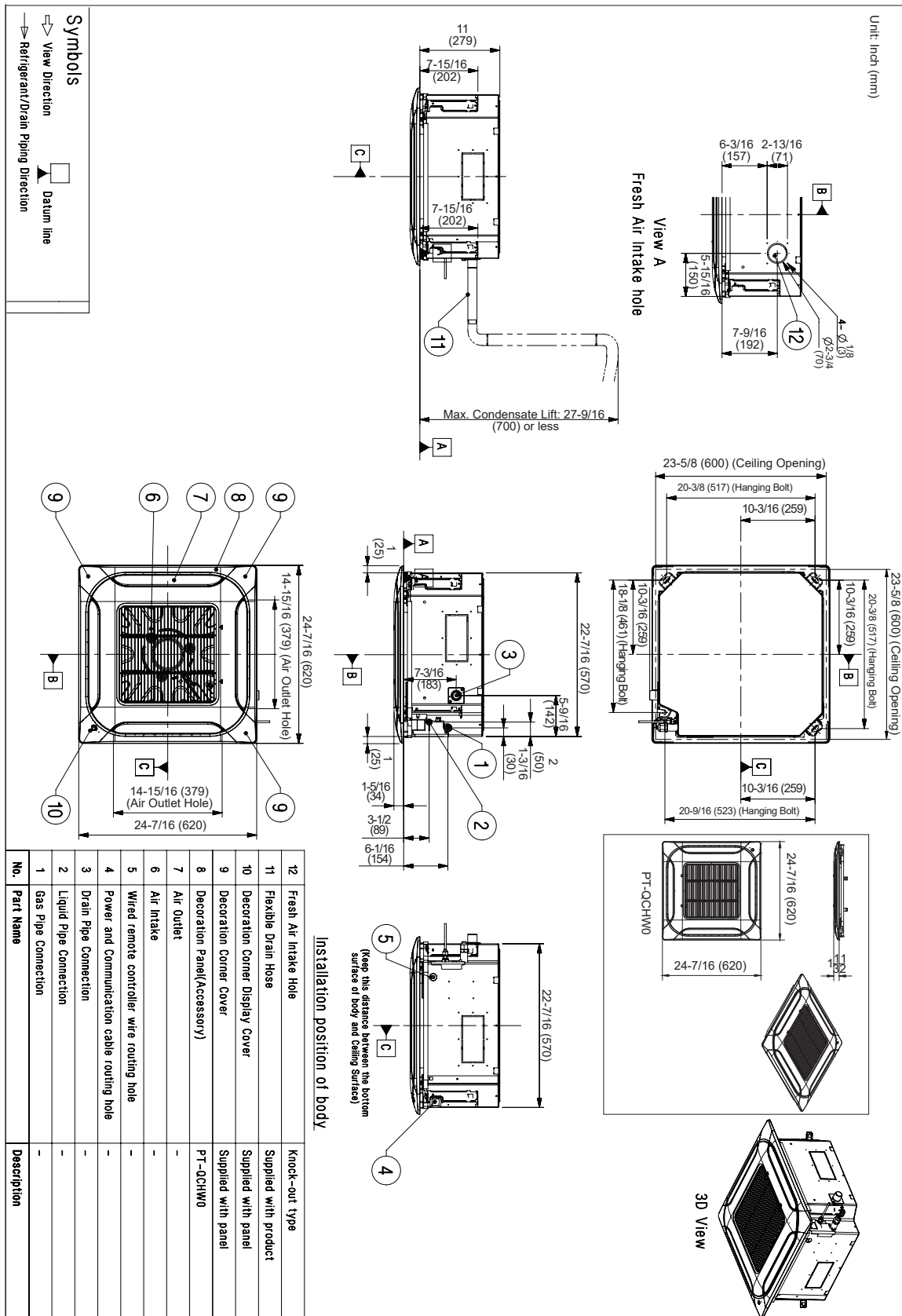


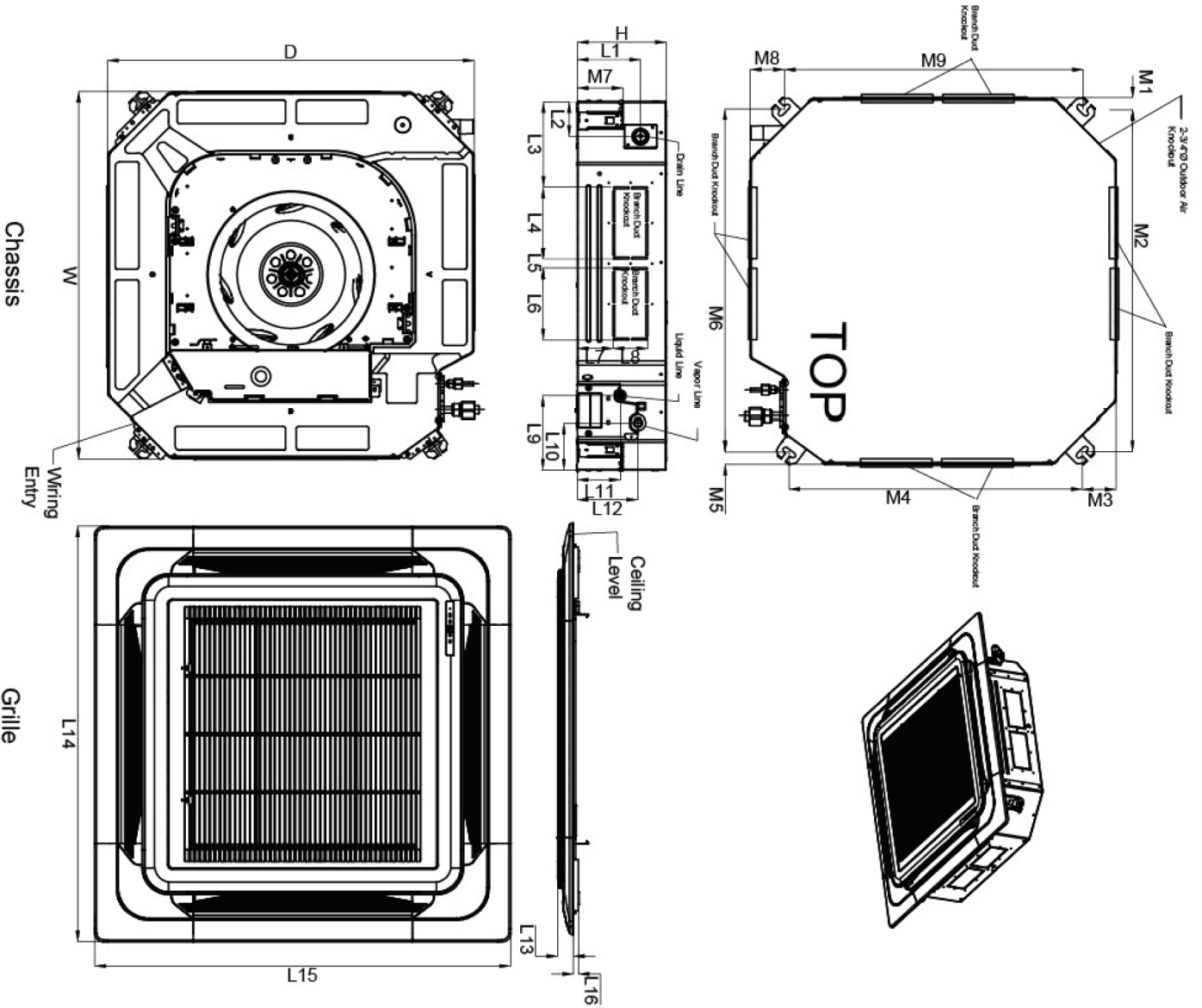
GENERAL DATA



Dimensions – TQ Frame

MULTI V Ceiling Cassette Indoor Units





W	33-1/16"
H	9-11/16"
D	33-1/16"
L1	6-11/16"
L2	3-1/8"
L3	7-11/16"
L4	6-1/2"
L5	3/4"
L6	6-1/2"
L7	3-11/16"
L8	3-15/16"
L9	6-5/8"
L10	4-5/16"
L11	3-15/16"
L12	5-7/16"
L13	1-7/16"
L14	37-3/8"
L15	37-3/8"
L16	1/2"
M1	1-1/16"
M2	30-15/16"
M3	3-1/16"
M4	26-7/16"
M5	1-1/16"
M6	30-15/16"
M7	4-1/8"
M8	3-1/16"
M9	26-15/16"

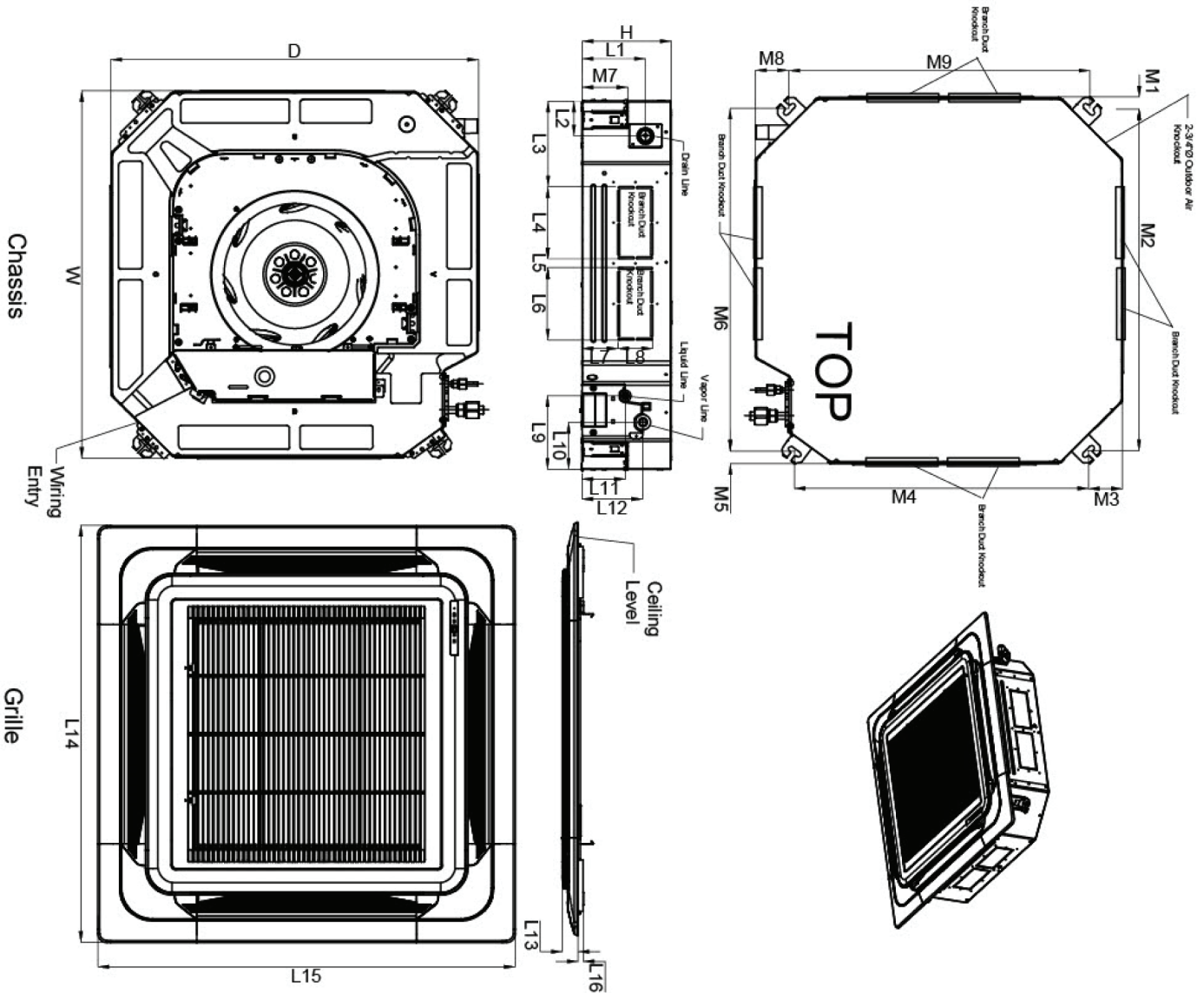
Note - All dimensions have a tolerance of ±0.25 in.

GENERAL DATA



Dimensions – TM Chassis

MULTI V Ceiling Cassette Indoor Units



W	33-1/16"
H	11-5/16"
D	33-1/16"
L1	8-9/16"
L2	3-1/8"
L3	7-11/16"
L4	6-1/2"
L5	3/4"
L6	6-1/2"
L7	4-1/16"
L8	3-15/16"
L9	6-5/8"
L10	4-5/16"
L11	4"
L12	5-1/2"
L13	1-7/16"
L14	37-3/8"
L15	37-3/8"
L16	1/2"
M1	1-1/16"
M2	30-15/16"
M3	3-1/16"
M4	26-7/16"
M5	1-1/16"
M6	30-15/16"
M7	4-1/8"
M8	3-1/16"
M9	26-15/16"

Note - All dimensions have a tolerance of ± 0.25 in.

Figure 4: Refrigerant Piping Diagram TU, TT Frame.

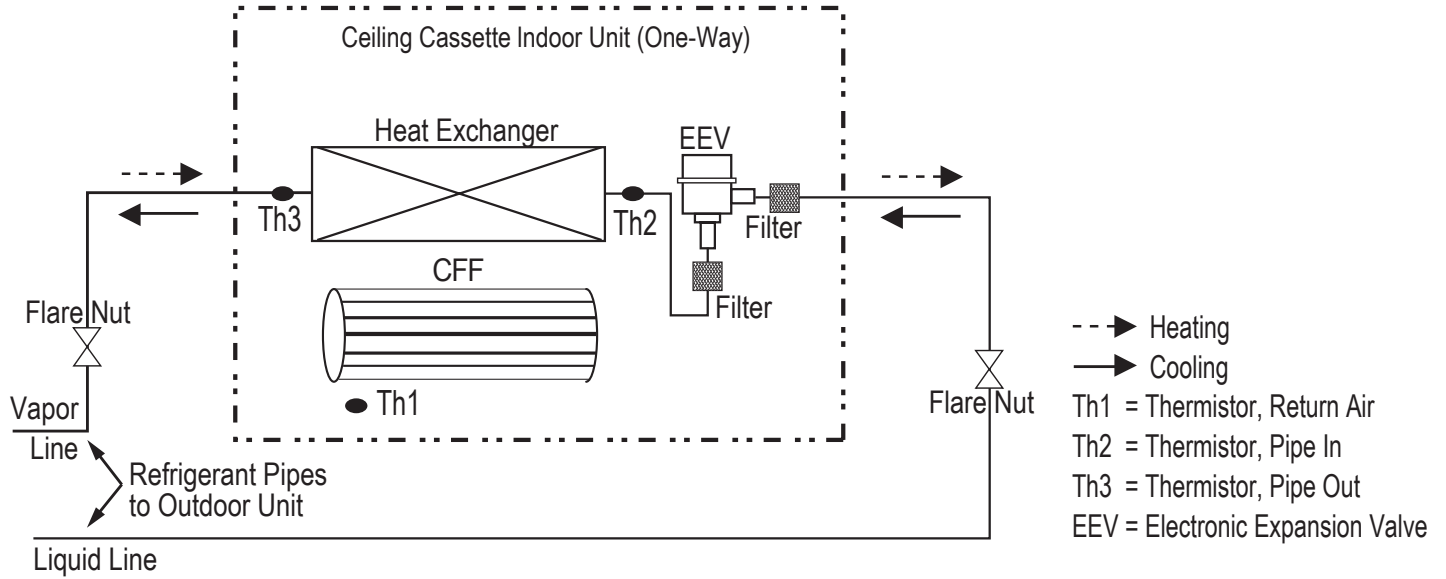
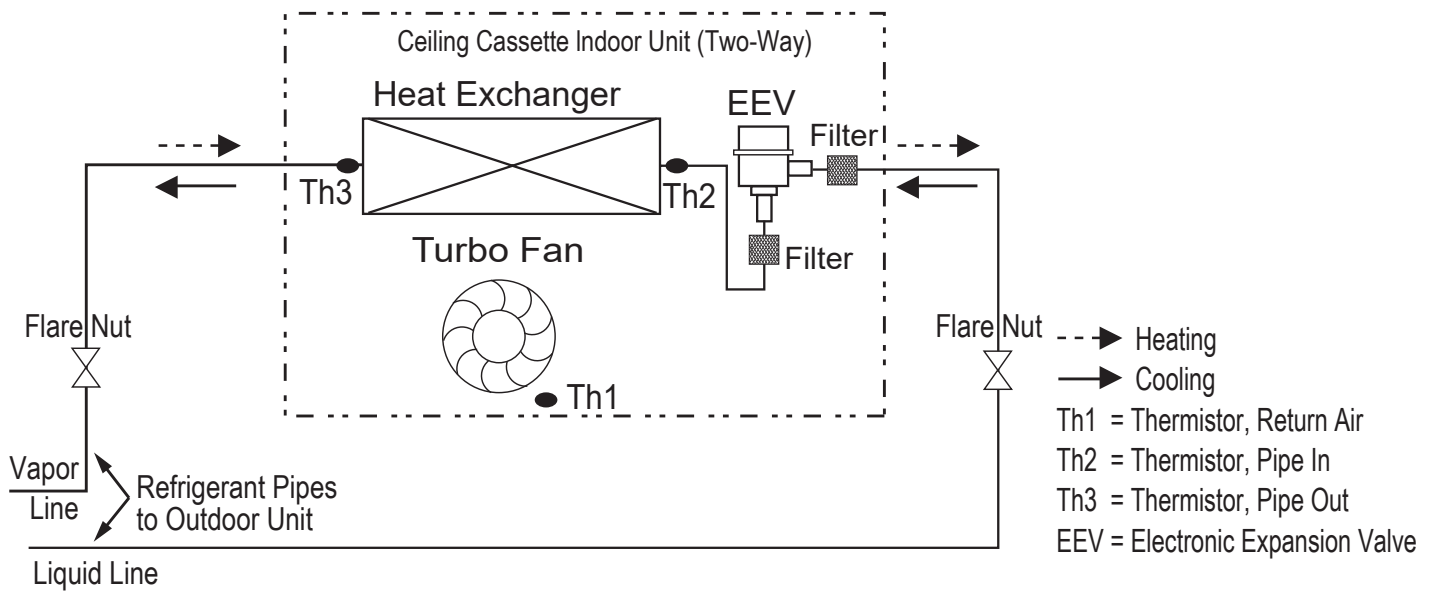


Figure 5: Refrigerant Piping Diagram TS Frame.

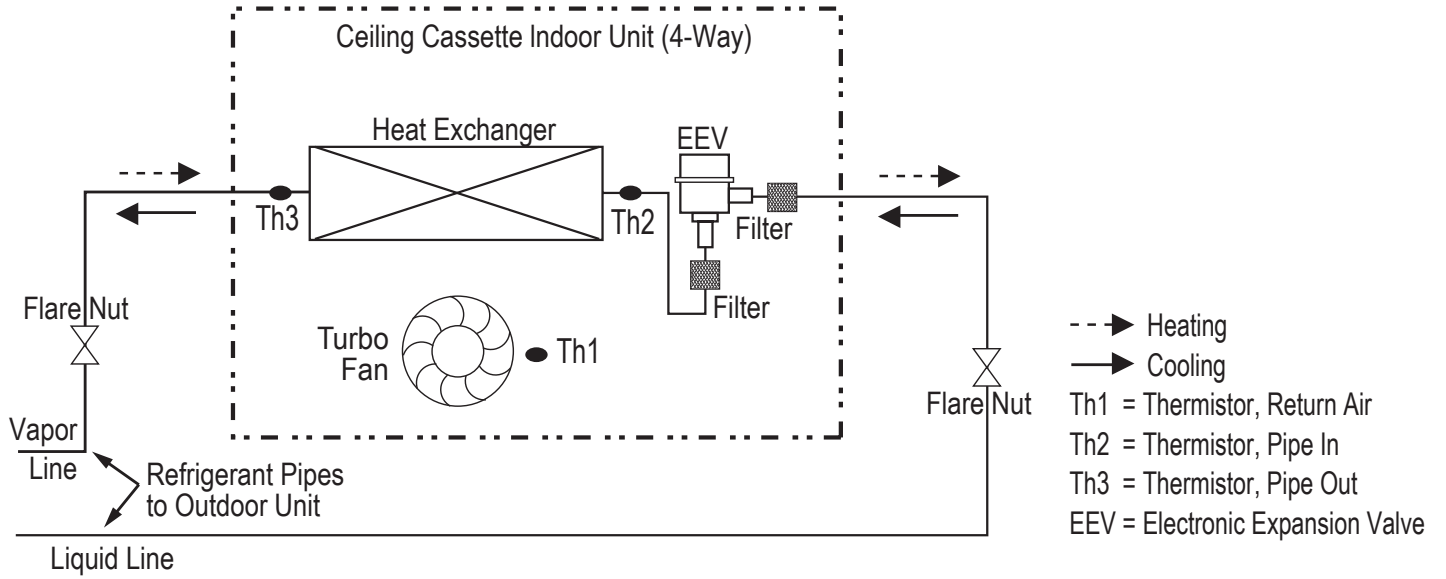


GENERAL DATA



Refrigerant Piping Diagrams

Figure 6: Refrigerant Piping Diagram TR, TQ, TN, and TM Chassis



MULTI V Ceiling Cassette Indoor Units

Location Selection

Note:

Follow recommended best practices when choosing a location for the Cassette 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.

Select a location for installing the Cassette Indoor Unit (IDU) that meets the following conditions:

Do's

- Where there is enough structural strength to bear the weight of the unit.
- Place the unit where air circulation will not be blocked.
- Place the unit where operating sound from the unit will not disturb occupants.
- Include enough space for service access.
- Place the unit where drainage can be obtained easily and to minimize the length of the condensate drain piping; include space for drainage to ensure condensate flows properly out of the unit when it is in cooling mode.
- Ensure there is sufficient space from the ceiling and floor.
- Use a level indicator to ensure the unit is installed on a level plane.
- Locate the indoor unit in a location where it can be easily connected to the outdoor unit / heat recovery unit.
- Use the provided pattern to determine the size of the ceiling opening and the hanging bolt locations required by the unit.

Ⓣ Don'ts

- Ⓣ Do not install the unit where it will be subjected to direct thermal radiation from other heat sources.
- Ⓣ Do not install the unit in a location where acidic solution and spray (sulfur) are often used.
- Ⓣ Do not use the unit in environments where oil or sulfuric gas are present.
- Ⓣ Do not install the unit near high-frequency generator sources.
- Ⓣ 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 malfunction of the condensate drain. If this is a potential problem, install a ventilation fan large enough to vent out these materials.

⚠ WARNING

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

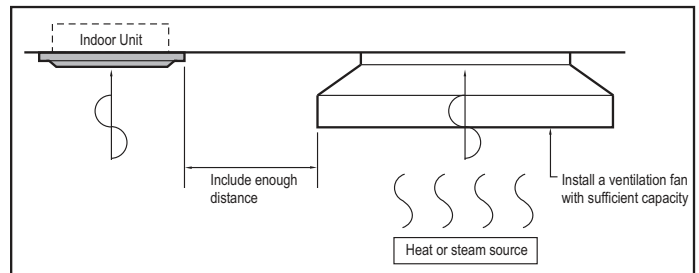
Note:

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

Note:

- Indoor units (IDUs) should 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 should 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 7: Installing Near a Heat or Steam Source.



Location Selection / Required Clearances

Installing in an Area Exposed to Unconditioned Air

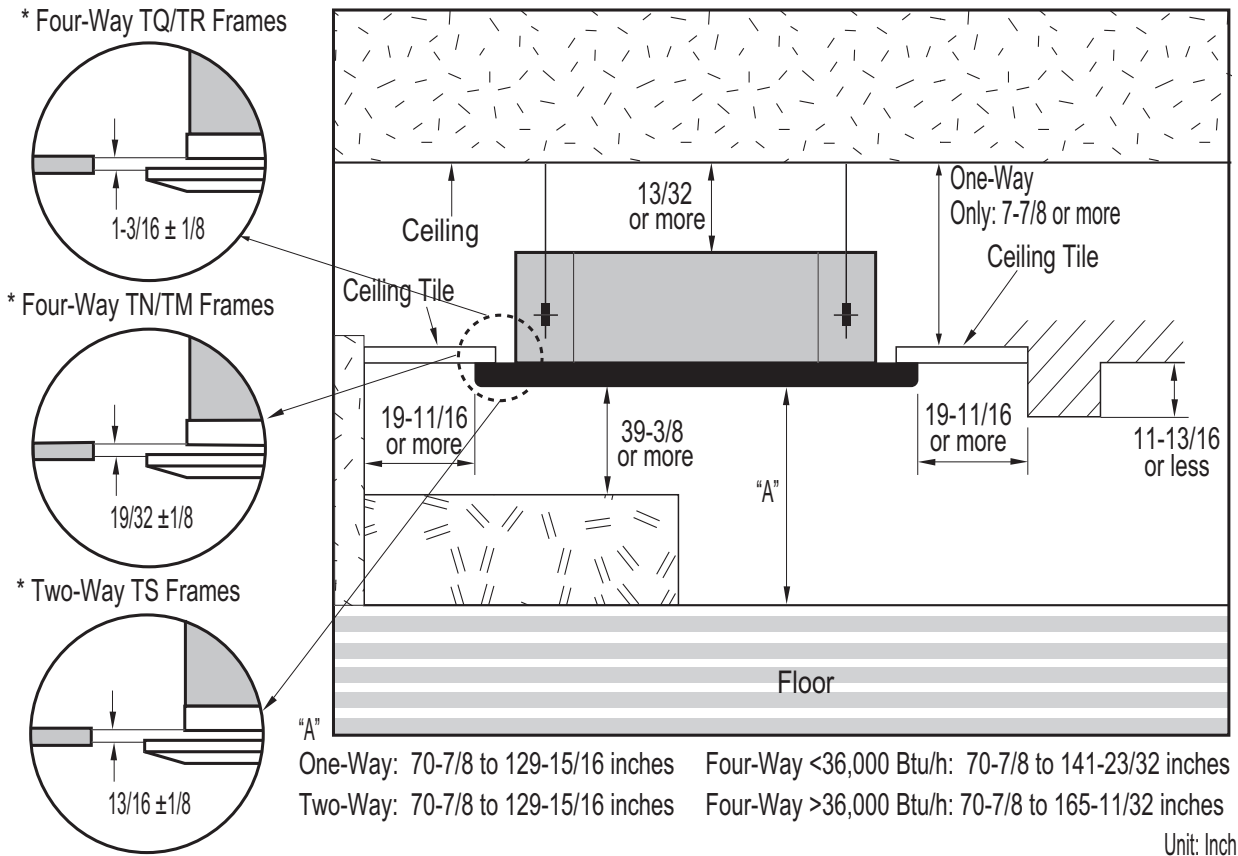
In some installation applications, areas (floors, walls) in some rooms may be exposed to unconditioned air. The room may be above or next to an unheated garage or storeroom. To counter this condition:

- 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 for Cassette Indoor Units

See the figure below for required clearance distances around a typical installed Cassette indoor unit.

Figure 8: Selecting the Best Location / Minimum Clearance Requirements — One-, Two-, and Four-Way Ceiling-Cassette Indoor Units.



Unpack and Inspect for Freight Damage

⚠ CAUTION

Shipping and net weights of the ceiling cassette units are listed in the specification tables in the beginning of this manual. To help avoid injury to personnel, use at least two people when carrying a unit by hand.

Note:

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

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

INSTALLATION



Install Cassette Frame

Preparing the Installation Area Using the Cassette Template

1. Cassette indoor units include installation guides (templates) that depict the exact dimensions necessary for the ceiling opening. One is a paper template that is found in the cassette indoor unit shipping materials; the other template is the cardboard on the bottom of the packaging.
2. Use the provided paper template or corrugated cardboard from the bottom packaging as a guide to determine the size of the ceiling opening and the hanging bolt locations required by the unit. The dimensions of the paper model for installation are the same as those of the ceiling opening dimensions. To access, carefully cut away corrugated cardboard from the packing material.
3. Using one of the templates, choose the location for the indoor unit. Mark where the four (4) suspension / hanger bolts, refrigerant piping, and drain hose should be. Suspension bolt angle must account for drain direction.

Figure 9: Paper Template or Corrugated Cardboard Used as a Guide (Example Only; Appearances Will Vary Depending on Model).

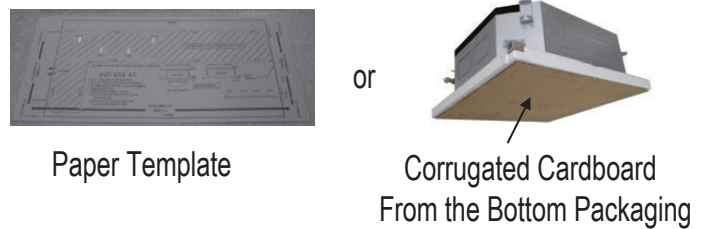


Figure 10: Accessing the Paper Template or Corrugated Cardboard Used as a Guide (Example Only; Appearances Will Vary Depending on Model).

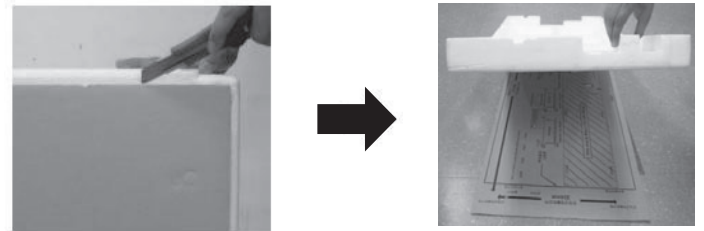


Figure 11: Ceiling Opening / Hanging Bolt Locations for One-Way Ceiling Cassette Indoor Units.

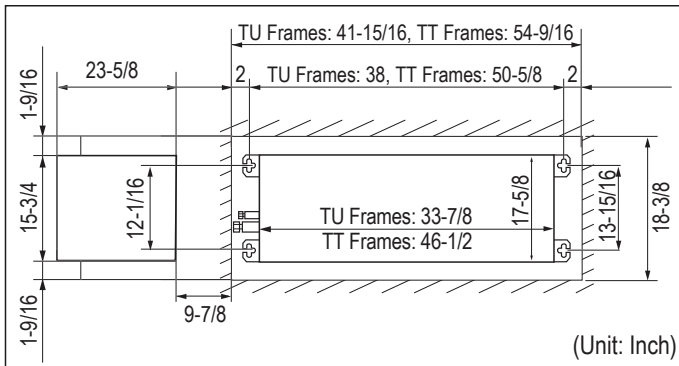


Figure 12: Ceiling Opening / Hanging Bolt Locations for Two-Way Ceiling Cassette Indoor Units.

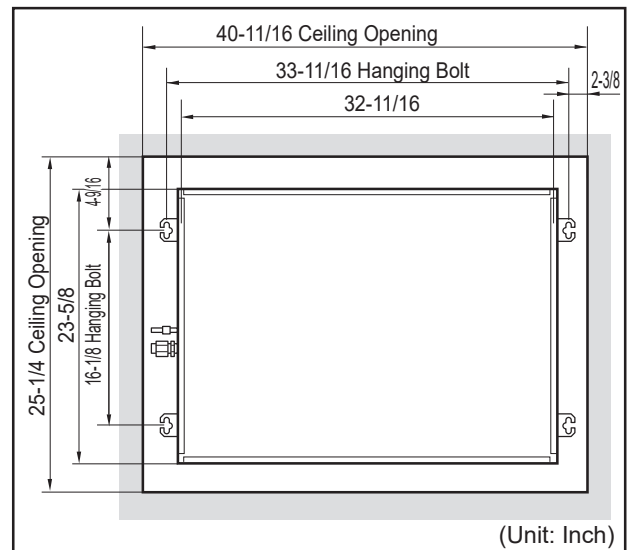
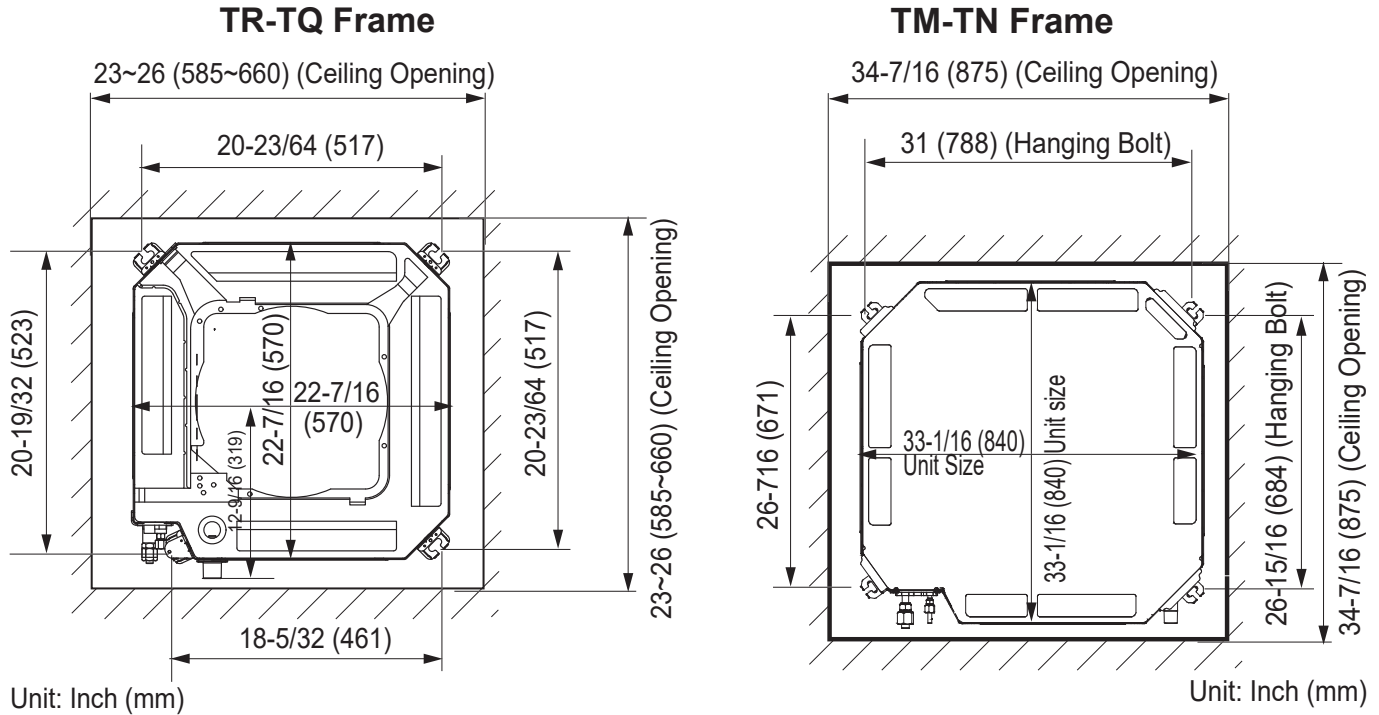


Figure 13: Ceiling Opening / Hanging Bolt Locations for Four-Way Ceiling Cassette Indoor Units.



Hanging the Cassette Indoor Units

⚠ WARNING

- The threaded rod hangers (bolts) and hardware must be securely installed to prevent the frame falling from its location. There is risk of personnel injury from falling equipment.
- Installation work must be performed by trained personnel and in accordance with all local or other applicable codes. There is risk of personnel injury from incorrect installation.
- During installation, ⚡ do not damage the cable / wiring. There is a risk of electrical shock, fire, physical injury and / or death.

Note:

- The threaded rod hangers (bolts) and hardware must be securely installed to prevent the frame falling from its 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 frame is installed on a level plane. Incorrectly installed units can result in degraded performance or an inoperative unit/system.
- Use the provided pattern to determine the size of the ceiling opening and the threaded rod hanger locations required by the unit.

Figure 14: Ceiling Opening and Threaded Rod Hanger Locations.

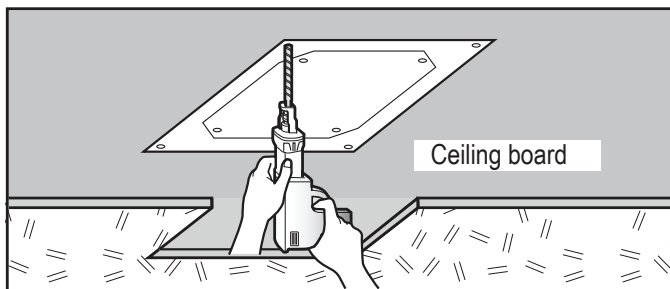
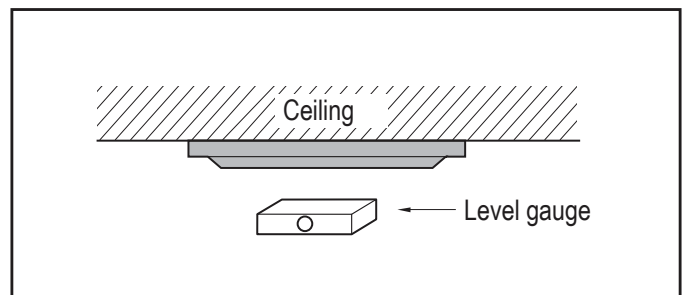


Figure 15: Level the Ceiling Cassette Frame.



INSTALLATION



Install Cassette Frame

Hanging the Cassette Indoor Units, continued.

1. Drill holes for the four (4) suspension / hanger bolts.
2. Securely install the four field-provided threaded rod hangers.
3. Refer to the figure below and hang the cassette frame from the four field-supplied hangers.
4. Use a level to ensure the frame is level. All ceiling cassettes use a condensation drain pump, and the frame must be level.
5. If local code requires an auxiliary drain pan under the unit, install a field-provided auxiliary drain pan.

The following parts are field supplied:

- Hanging bolt - W-3/8" or M10
- Nut - W-3/8" or M10
- Spring washer - M10

The following parts are included with the indoor unit:

- Flat washer - M10

Figure 16: Installing the Hanging Bolt in the Ceiling.

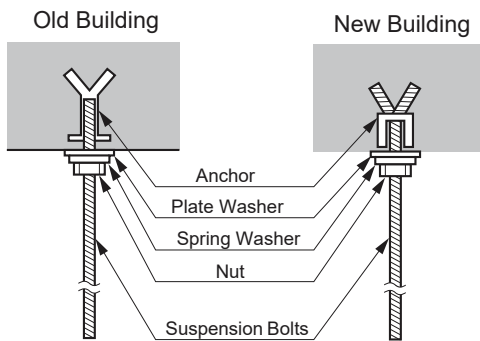
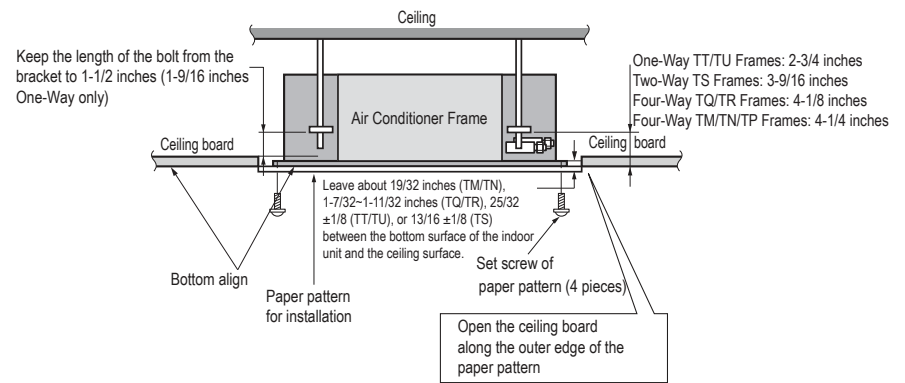


Figure 17: Installation Diagram.



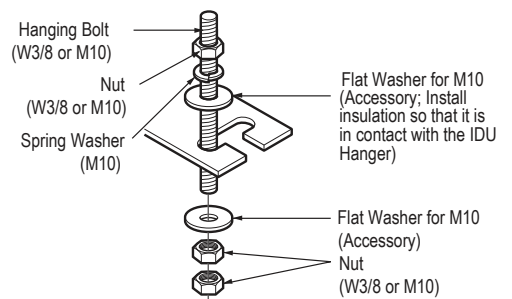
⚠ WARNING

- The threaded rod hangers (bolts) and hardware must be securely tightened to prevent the unit from falling from its installation location. There is a risk of personal injury from falling equipment.
- During installation, ⚡ do not damage the cable / wiring. There is a risk of electrical shock, fire, physical injury and / or death.

For New Ceilings

1. Use a sunken insert, a sunken anchor, or any other field-supplied part to reinforce the ceiling so that it can bear the weight of the indoor unit. Use a temporary washer plate to more easily set up the unit suspension location.
2. Ceiling height is shown on the side of the installation guide (template). Adjust the height of the unit accordingly. Adjust the clearance before hanging the indoor unit.
3. Refer to the installation guide (template) for the dimensions to the ceiling opening. Match the center of the indoor unit (labeled) to the center indicated on the installation guide.
4. Align the installation guide (template) with the label attached to the unit (affixing the template to the unit if desired) to properly place the unit.
5. Remove the temporary washer plate and position the indoor unit hanger brackets on the bolts. Secure with nuts and washers on the top and bottom of the hanger brackets.
6. Ceiling-cassette indoor units are equipped with a built-in drain pump, therefore, the unit must be installed horizontally or condensate will drip out and cause product malfunction. Measure the unit at each corner to verify that it is level.
7. Remove the installation guide (template).

Figure 18: Hanging the Indoor Unit.




For Existing Ceilings

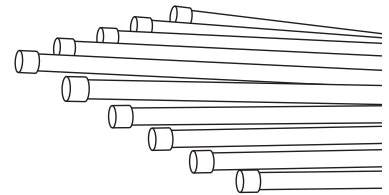
1. Use anchors when installing the indoor unit in an existing ceiling.
2. Ceiling height is shown on the side of the installation guide (template). Adjust the height of the unit accordingly. Adjust the clearance before hanging the indoor unit.
3. Remove the temporary washer plate and position the indoor unit hanger brackets on the bolts. Secure with nuts and washers on the top and bottom of the hanger brackets.
4. Ceiling-cassette indoor units are equipped with a built-in drain pump and float switch, therefore, the unit must be installed horizontally or condensate will drip out and cause product malfunction. Measure the unit at each corner to verify that it is level.
5. Remove the installation guide (template).

Piping Materials and Handling

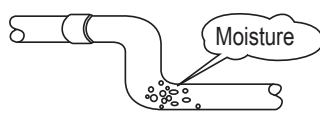
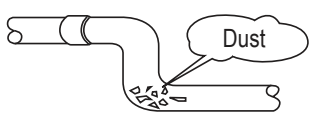
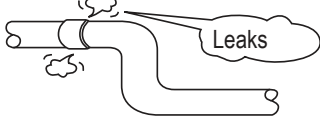

Pipes used for the refrigerant piping system must include the specified thickness, and the interior must be clean.

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 should be inside the piping. 	No dust should be inside the piping. 	No leaks should occur. 
Possible Problems	<ul style="list-style-type: none"> - Significant hydrolysis of refrigerant oil. - Refrigerant oil degradation. - Poor insulation of the compressor. - System does not operate properly. - EEVs, capillary tubes are clogged. 	<ul style="list-style-type: none"> - Refrigerant oil degradation. - Poor insulation of the compressor. - System does not operate properly. - EEVs and capillary tubes become clogged. 	<ul style="list-style-type: none"> - Refrigerant gas leaks / shortages. - Refrigerant oil degradation. - Poor insulation of the compressor. - System does not operate properly.
Solutions	<ul style="list-style-type: none"> - Remove moisture from the piping. - Piping ends should remain capped until connections are complete. -  Do not install piping on a rainy day. - Connect piping properly at the unit's side. - Remove caps only after the piping is cut, the burrs are removed, and after passing the piping through the walls. - Evacuate system to a maximum of 500 microns and insure the vacuum holds at that level for 1 hour. 	<ul style="list-style-type: none"> - Remove dust from the piping. - Piping ends should remain capped until connections are complete. - Connect piping properly at the side of the unit. - Remove caps only after the piping is cut and burrs are removed. - Retain the cap on the piping when passing it through walls, etc. 	<ul style="list-style-type: none"> - Test system for air tightness. - Perform brazing procedures that comply with all applicable standards. - Perform flaring procedures that comply with all applicable standards. - Perform flanging procedures that comply with all applicable standards. - Ensure that refrigerant lines are pressure tested to 550 psig and hold for 24 hours.

Pipe Supports

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 shall meet local codes. If local codes do not specify pipe support spacing, pipe must be supported:

- 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 21: Pipe Support at Indoor Unit.

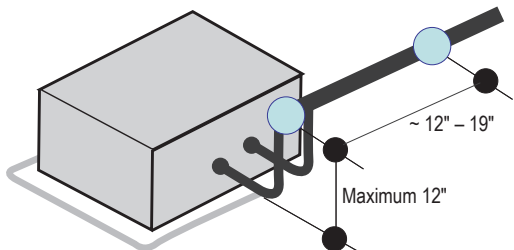


Figure 22: Pipe Support at Y-branch Fitting.

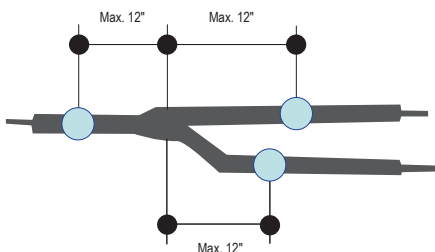


Figure 23: Pipe Support at Header Fitting.

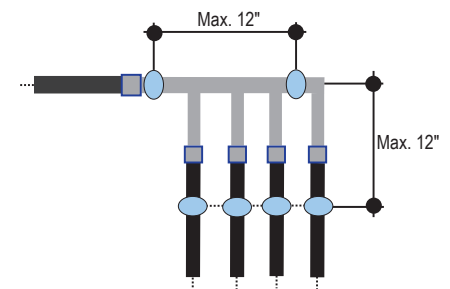
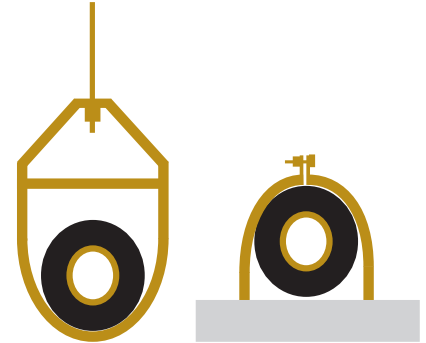


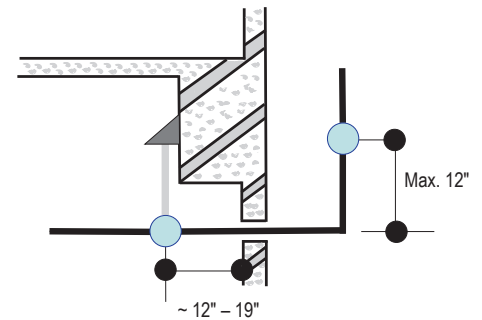
Figure 19: Pipe Hanger Details.



Note:

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

Figure 20: Typical Pipe Support Location—Change in Pipe Direction.



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 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 caused by excessive bending in one specific area on its length.

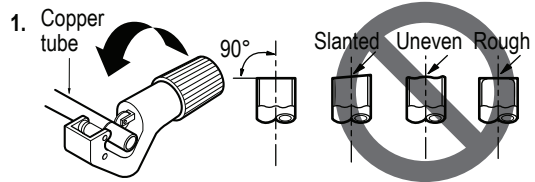
Flaring Procedure

Note:

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

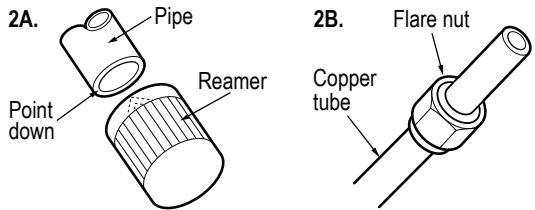
1. Cut the pipe to length.

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



2A. Remove the burrs.

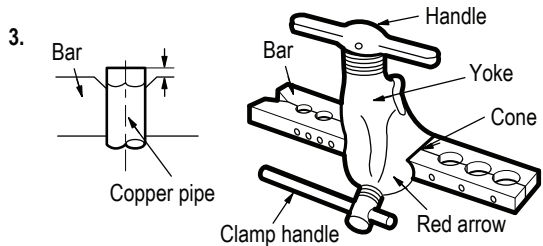
- Completely remove all burrs from pipe ends.
- When removing burrs, point the end of the copper pipe down to avoid introducing foreign materials in the pipe.



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

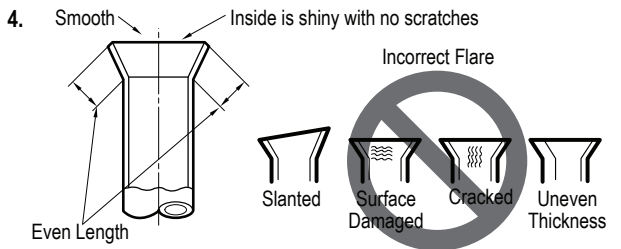
3. Flaring the pipe end.

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

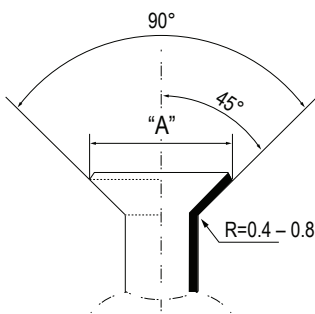


4. Carefully inspect the flared pipe end.

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



Dimensions of the Flare.



Flared Connection Dimensions / Tightening Torque.

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

REFRIGERANT PIPING



Piping Preparation

Note:

⊘ Do not over-tighten flare nuts. Excessive tightening will cause fittings to crack.

Tightening the Flare Nuts

Tightening Torque for Flare Nuts.

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

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

Note:

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

⊘ Do not add any contaminants inside the refrigerant piping.

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

Loosening the Flare Nuts

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

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.

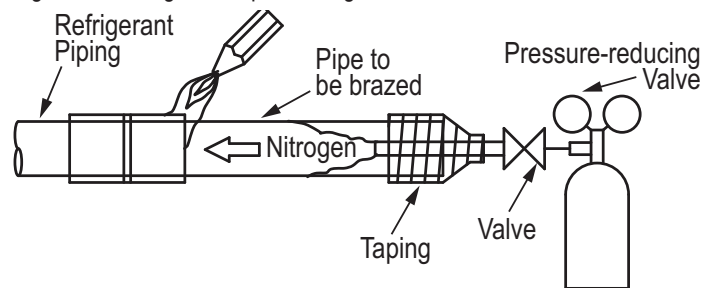
If the refrigerant combusts, it generates a toxic gas that may cause physical injury or death.

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 24: 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.

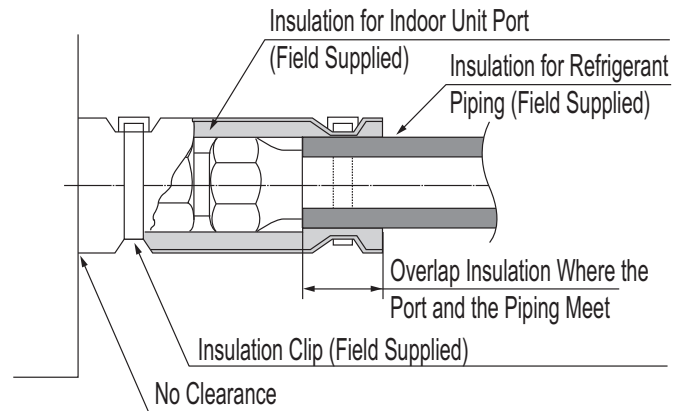
Flare Fittings:

- 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 25: Typical Refrigerant Line Flare Fitting Insulation Detail.



Insulating the Refrigerant Piping

Sufficiently insulate all cold surfaces to prevent moisture forming. All refrigerant 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.

General Cassette Indoor Unit Condensate Piping

All ceiling cassette indoor units have a factory-mounted condensate pump that runs continuously while the unit is in cooling mode. The pump has an internal high-level float switch that stops the unit if the water level in the pan rises too high.

All ceiling cassette units have a flexible drain hose kit and one or two clamps. The hose can be used to connect the condensate pipe to the condensate pump connection.

Note:

When connecting the condensate piping, Ⓞ do not exert lateral force on the drain nipple. Internal damage will occur. Refer to the table above for condensate pipe connection sizes.

Condensate Pump Connection

Note the following when connecting the condensate pipe to the unit.

- Indoor units Ⓞ DO NOT come with check valves or a backflow prevention device. If check valves are needed, they must be field supplied.
- The maximum lift of all condensate pumps is 27-9/16 inches (700 mm).
- Measure lift distance from the bottom surface of the indoor unit, Ⓞ NOT from the condensate pipe connection.

Cassette Unit Drain Information

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 horizontally, 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.

No Gravity Condensate Pipe Connection

Ceiling cassette indoor units do not have a gravity condensate pipe connection. There is a service drain plug on the bottom of each unit under the decorative panel. This drain plug is intended as a service feature and is not to be used as a permanent gravity drain connection.

Table 11: Indoor Unit Drainage Specifications.

Indoor Unit	Drain Type	Drain Pipe Dia. (OD / ID, in.)
One-Way Ceiling Cassette	27-9/16 in. (700 mm) Max. Lift Drain Pump, Factory Installed	Ø1-1/4 / Ø1
Two-Way Ceiling Cassette		
Four-Way Ceiling Cassette		

Figure 26: Cassette Indoor Unit Drain Pump (Interior View).

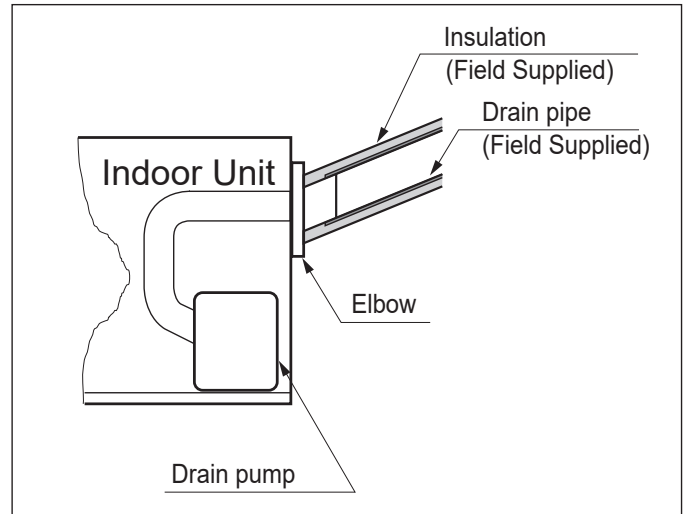
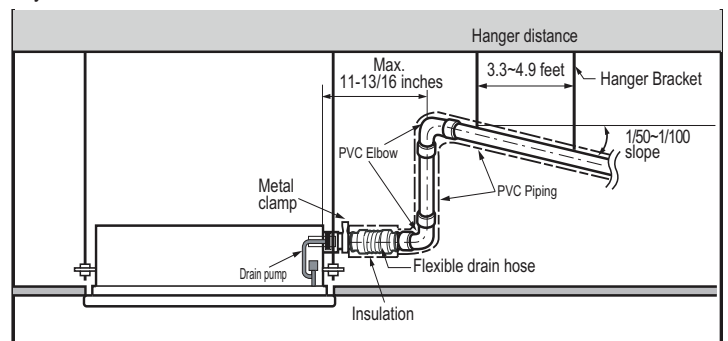


Figure 27: Ceiling Cassette Indoor Unit Drain Pump to Drain Piping System.



Condensate Drain Piping Installation

- Drain piping must slope down 1/50 to 1/100 or flow will reverse back to unit.
- Any holes through the ceilings, walls etc., must be large enough to accommodate the drain piping and insulation.
- Refer to the table on the previous page for drain pipe sizing.
- During drain piping connection, be careful not to exert extra force on the drain port on the indoor unit.
- Use polyvinyl chloride pipe.

1. Refer to the figure at above right, and plan the drain pipe routing so that the pipe will slope downward from the indoor unit to its end drain location.

2. Connect the provided flexible drain pipe to the main drain pipe.

Note:

The supplied flexible drain hose must not be installed with a sharp curve or twist. A curved or twisted flexible hose will become damaged due to vibration and / or leaks.

3. Pour water into the flexible pipe as shown in the figure at right to test for leaks. Repair leaks if necessary.

4. Route the flexible drain pipe to the indoor unit and connect the flexible drain pipe to the drain port of the indoor unit.

5. Install field-supplied polyethylene foam insulation 5/16 inch thick or greater on the flexible drain pipe, and position snugly against indoor unit.

Figure 28: Drain Piping Slope.

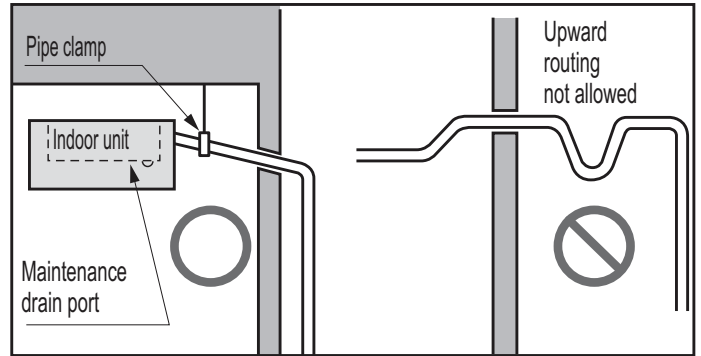


Figure 29: Do Not Sharply Bend the Drain Pipe.

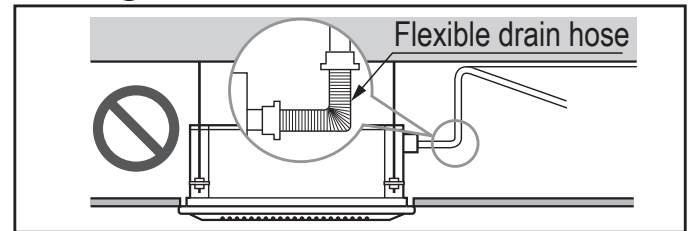
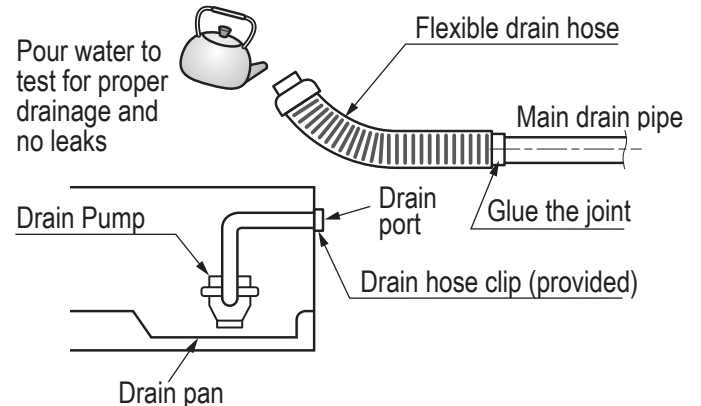


Figure 30: Testing the Drain Pipe.



Decorative Cover Installation

Note:

- Decorative cover is an optional accessory that is sold separately.
- Before installing the decorative panel, always remove the paper template first.
- Optional plasma filters are available for these indoor units. If used, install the optional plasma filter before installing the decorative cover. Refer to the installation instructions in the optional plasma filter kit.

1. Install two decorative cover attaching screws on the cassette frame. Tighten about 3/8 inch.
2. Remove the air inlet grille from the decorative cover. (Remove the hook for the air inlet grille cord.)
3. Hook the decorative cover key hole on the screws installed, and slide the panel so that the screws reach the key hole edge.
4. Tighten completely the two initially installed screws and two additional screws.
5. Connect the louver motor connector and display connector.
6. After tightening these screws, install the air inlet grille (including the air filter).

Figure 32: One-Way Cassette Decorative Cover Installation.

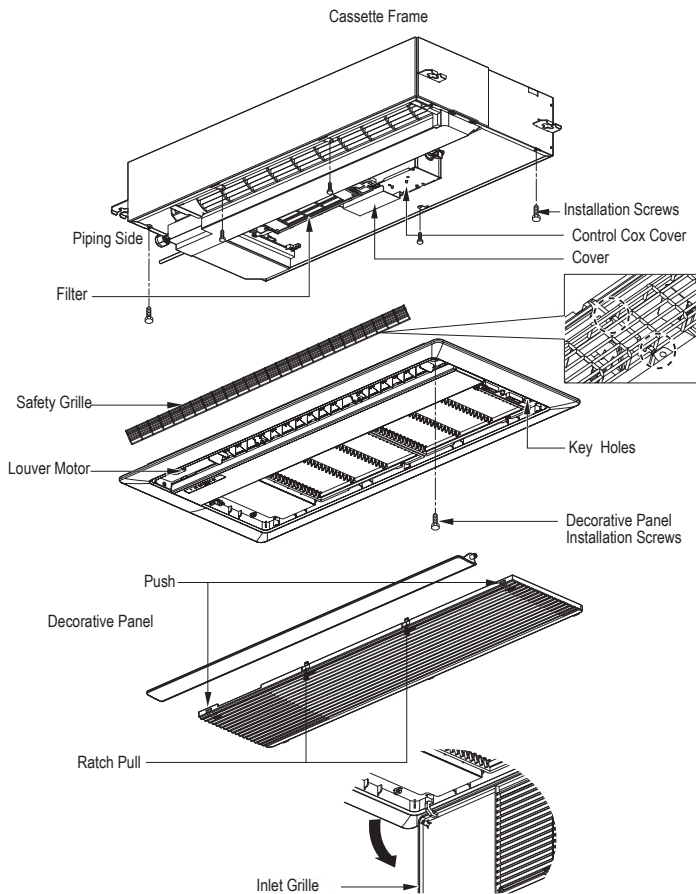


Figure 31: Two-Way Cassette Decorative Cover Installation.

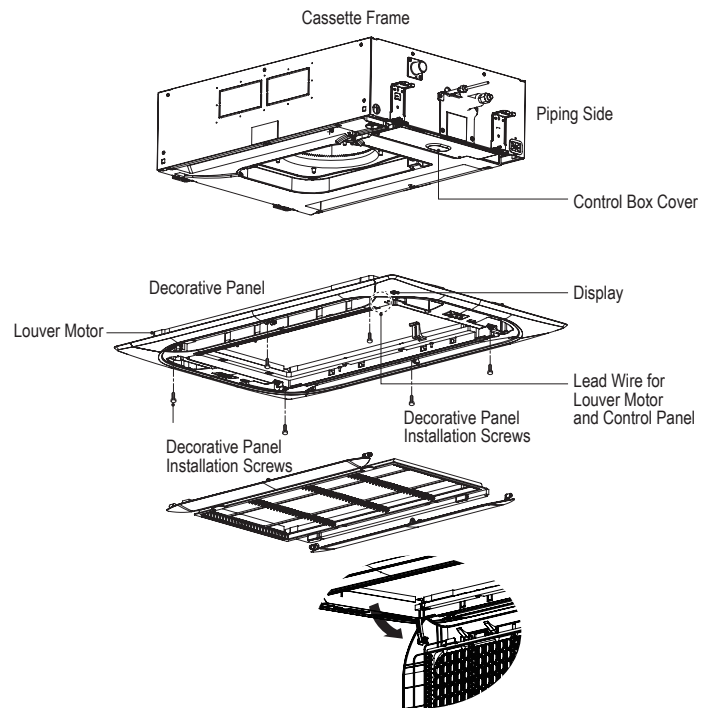


Figure 33: Properly Seating Decorative Cover Against the Two-Way Cassette Indoor Unit Frame.

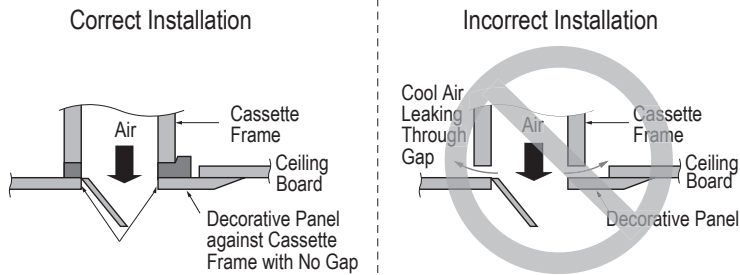


Figure 34: Four-Way Cassette Decorative Cover Installation.

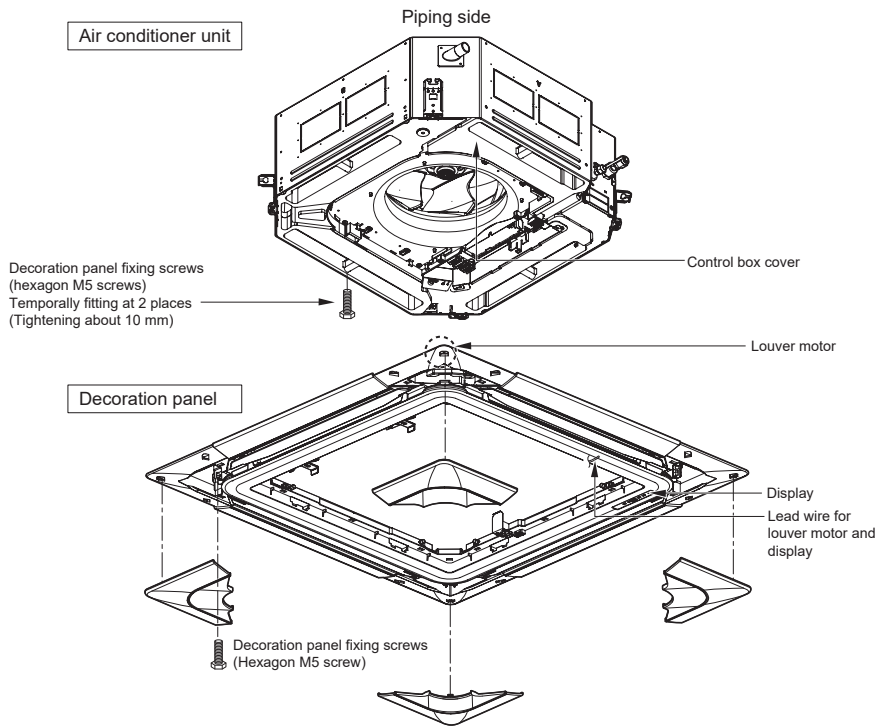


Figure 35: Swing Inlet Grille Downward on the Four-Way Cassette Indoor Unit Frame.

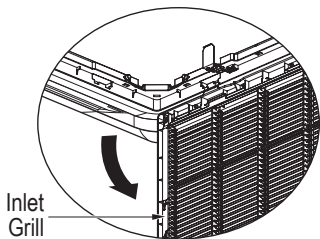
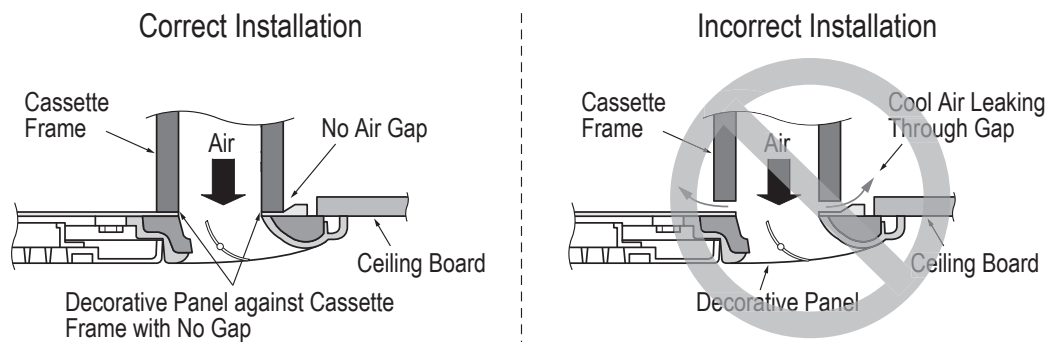


Figure 36: Properly Seating Decorative Cover Against the Four-Way Cassette Indoor Unit Frame.



Note:

Install the decorative cover snugly and without gaps. Any gaps between the ceiling and the cassette frame will release cool air, which will cause sweating. Water drops that fall will damage the surrounding ceiling, floor, and walls.

MULTI V Ceiling Cassette Indoor Units

⚠ 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 12: Power Wire and Communications Cable Minimum Required Separation Allowable Distances.

Capacity of Power Supply Wiring (current)	Minimum Required Distance ^{1,2}	
100V or more	10A	12 inches
	50A	20 inches
	100A	40 inches
	Exceeding 100A	60 inches

¹The 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.

²If the power supply waveform continues to exhibit some distortion, the 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.

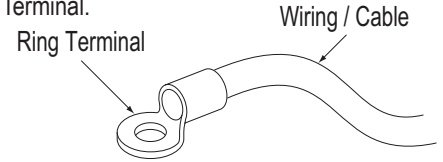


Power Wiring / Communication Cable Connections

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

- 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.

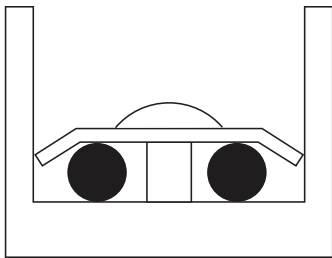
Figure 37: Close up of a Typical Ring Terminal.



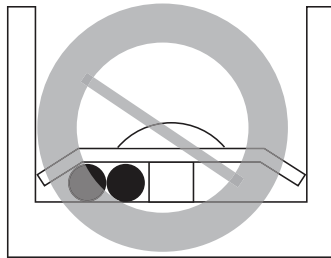
If ring terminals or fork terminals are not available, then:

- 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.

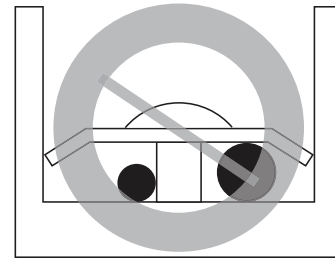
Figure 38: Proper and Improper Power Wiring Connections.



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.

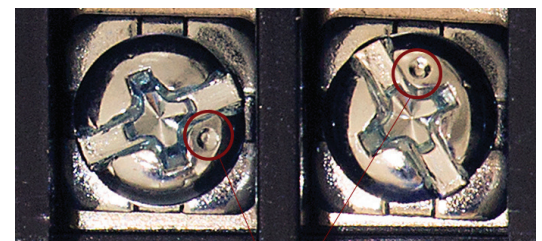
Terminal Connections

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 39: 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.

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.*

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 shall 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 multiple-core cable, it will result in a poor communications signal and unacceptable system operation.

Figure 40: Correct Master Outdoor Unit to Indoor Unit / Heat Recovery Unit Communication Wiring—Daisy Chain Configuration.

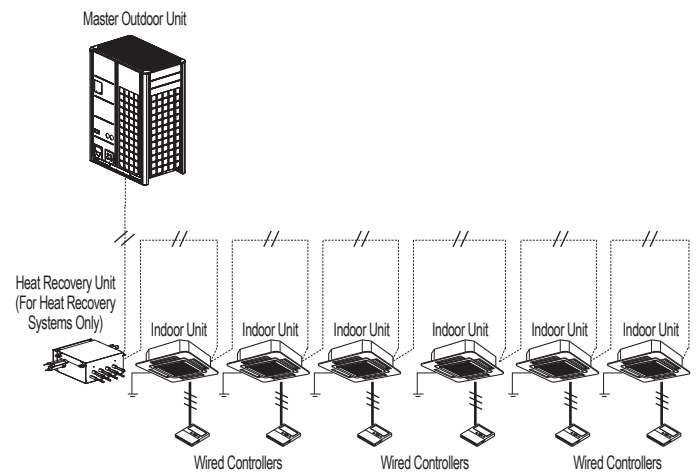
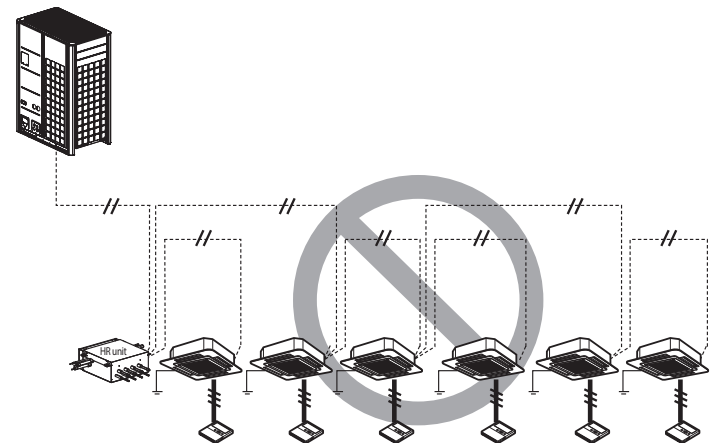


Figure 41: Incorrect Master Outdoor Unit to Indoor Unit / Heat Recovery Unit Communication Wiring—Starburst Configuration.



Communications Cable Specifications From Indoor Units to Remote Controllers

- Communication cable from Indoor Unit to Remote Controller(s) is to be LG supplied or field supplied 22 AWG, 3-conductor, twisted, stranded, unshielded. Wiring must comply with all applicable local and national codes.
- If using LG supplied cable and 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 LG supplied cable 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 42: One Example of Indoor Unit to Zone Controller Connection.

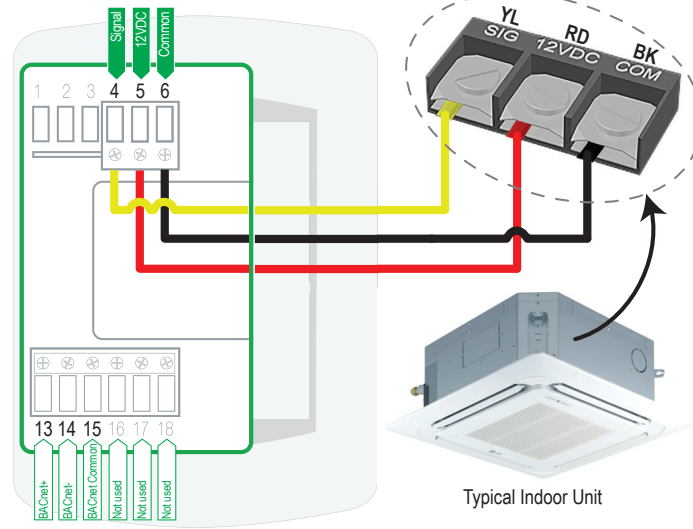
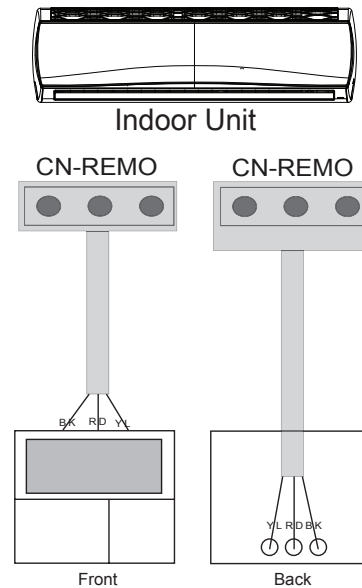


Figure 43: Another Example of Indoor Unit to Zone Controller Connection.



Note:

Cable connected to Zone Controller is the factory default connection.

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

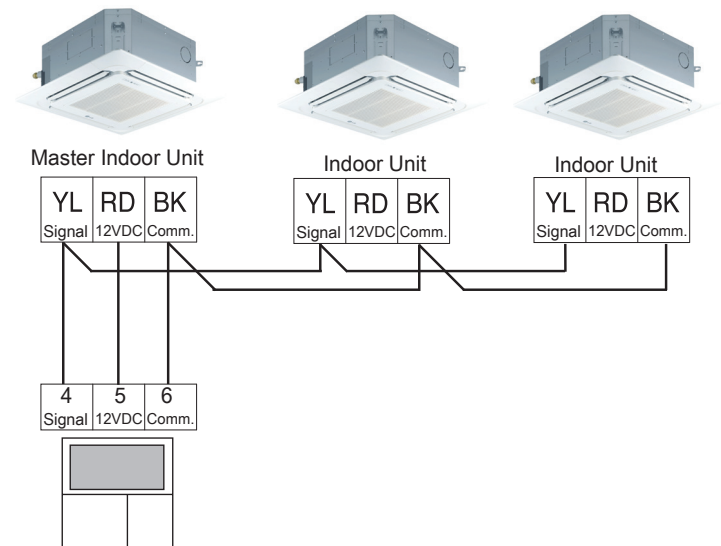
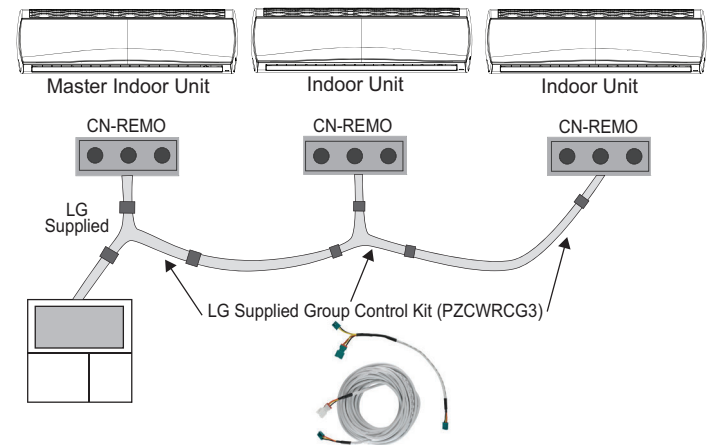


Figure 45: Example of Indoor Unit Group to Zone Controller Connections (CN-REMO).



MULTI V Ceiling Cassette Indoor Units


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.

Do Not's

- 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. Two-way and four-way cassettes feature wiring and cable paths on opposite side of the indoor unit. 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

6. Connect the power wiring to the terminal block connections. Ensure the screws securely connect the wire to the terminals and are not loose.
 - For One-Way Cassettes: Terminal Block 1(L1) and 2(L2) connections.
 - For Two-Way and Four-Way Cassettes: Terminal Block L(L1) and N(L2) connections.
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.

One-Way Cassette TT, TU Frames

Figure 46: Typical TT, TU Frame Wiring / Cable Routing.

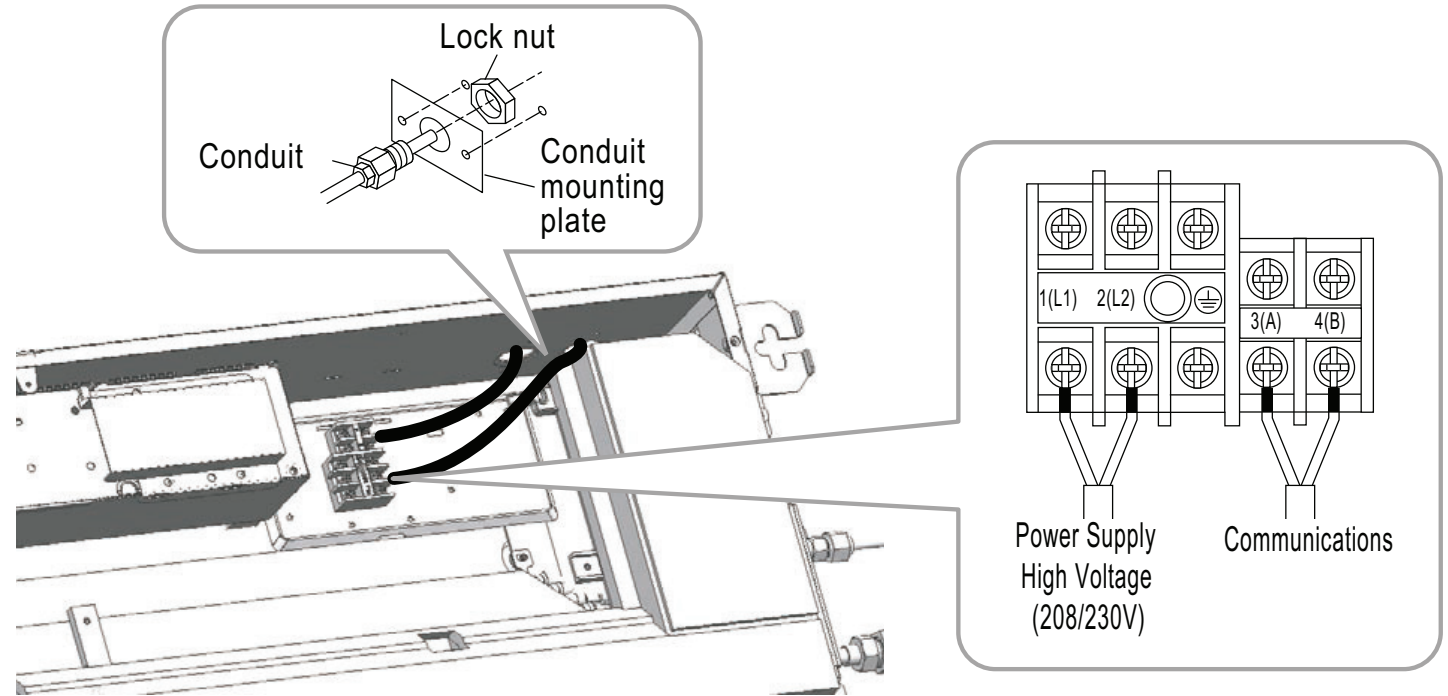
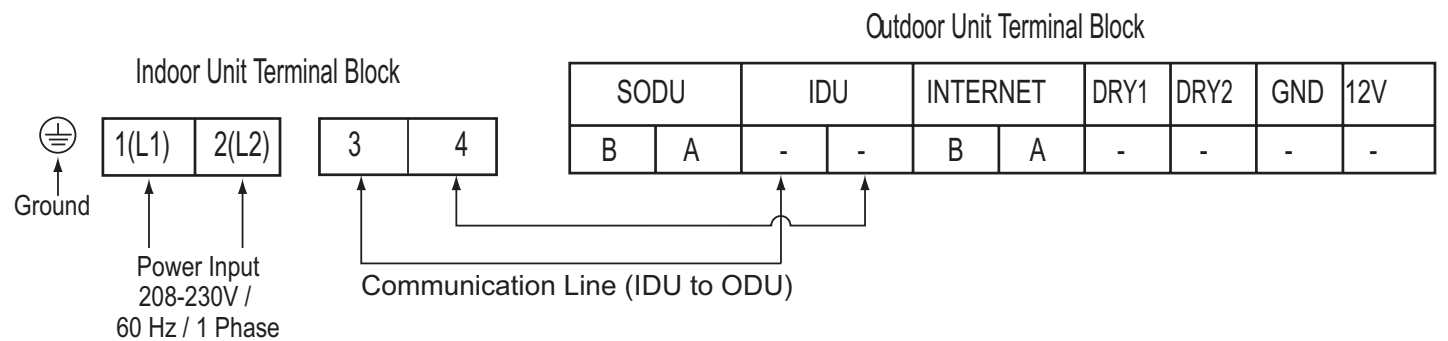


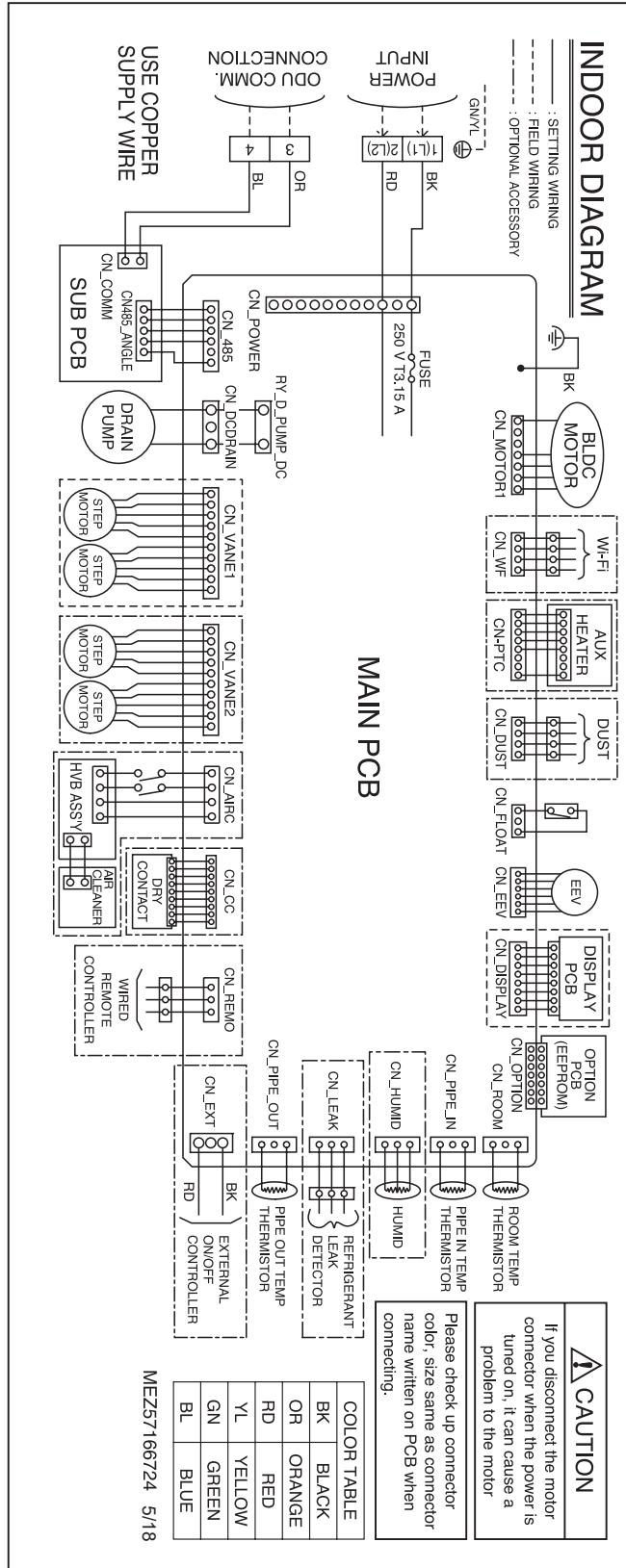
Figure 47: TT, TU Frame Wiring / Cable Connections.



WIRING

One-Way TT, TU Frame

Figure 48: TT, TU Frame Wiring Diagram.



MULTI V Ceiling Cassette Indoor Units

Table 13: TU, TT Frame Wiring Diagram Legend.

Terminal	Purpose	Function
CN_MOTOR1	Fan motor output	Motor output of BLDC
CN_WF	Wi-Fi module	Wi-Fi module connection
CN-PTC	Auxiliary heater	Auxiliary heater connection
CN_DUST	N/A	N/A
CN_FLOAT	Float switch input	Float switch sensing
CN_EEV	EEV output	EEV control output
CN_DISPLAY	Display	Display of indoor status
CN_OPTION	Option PCB (EEPROM)	Option PCB connection
CN_ROOM	Room sensor	Room air thermistor
CN_PIPE_IN	Suction pipe sensor	Pipe in thermistor
CN_HUMID	N/A	N/A
CN_LEAK	Leak sensor	Leak sensor connection
CN_PIPE_OUT	Discharge pipe sensor	Pipe out thermistor
CN_EXT	External on/off controller	External on/off controller connection
CN_REMO	Remote controller	Remote control connection
CN_CC	Dry Contact	Connection to Dry Contact (Optional)
CN_AIRC*	Air cleaner	Air cleaner control
CN_VANE2	Step Motor	Step motor output
CN_VANE1	Step Motor	Step motor output
CN_DCDRAIN	Drain pump output	AC output for drain pump
CN_485	Communication	Connection between indoor and outdoor units
CN_COMM	Communication	Connection on Sub PCB between indoor and outdoor units
CN_POWER	AC Power supply	AC power line input for indoor controller

Table 14: TU, TT Frame DIP Switch Settings

DIP Switch Setting		Off	On	Remarks
SW3	GROUP CONTROL	Master	Slave	Group control setting using 7-Day Programmable Controller; selects Master/ Slave on each indoor unit
SW4	DRY CONTACT MODE	Variable	Auto	Sets operation mode for optional Dry Contact accessory 1. Variable: Auto or Manual Mode can be set through 7-Day Programmable Controller or Wireless Remote Controller (factory default setting is Auto if there is no setting) 2. Auto: For Dry Contact, it is always Auto mode

*For Gen 4 Multi V one-way ceiling cassette indoor units, DIP switches 1, 2, 5 through 8 must be set to OFF. These DIP switches are used for other models.

**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.

WIRING



Two-Way Cassette TS Frame

Figure 49: Typical TS Frame Wiring / Cable Routing.

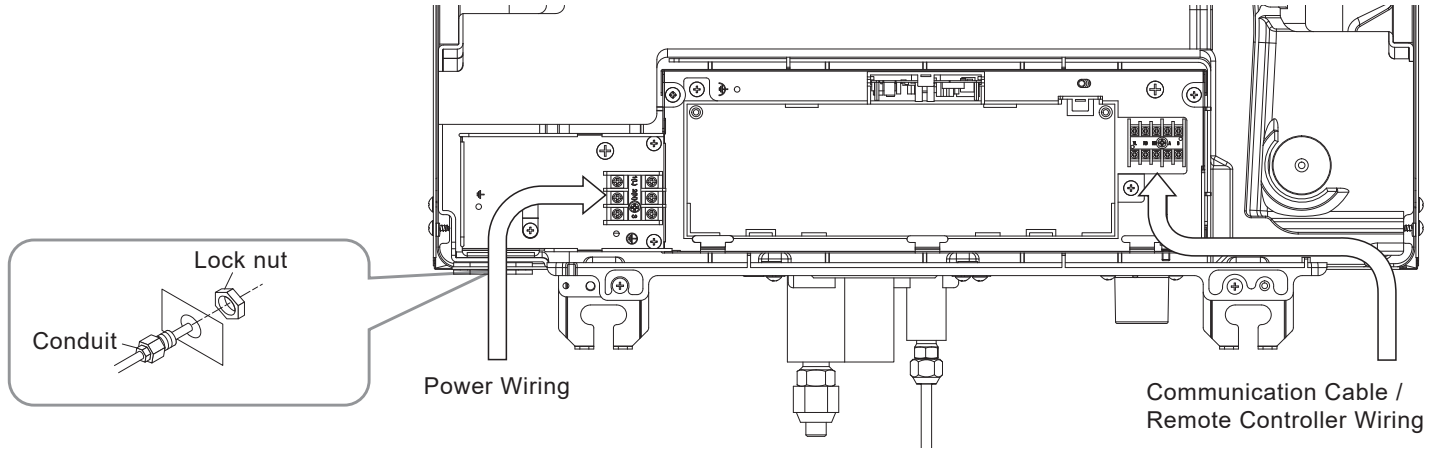


Figure 50: TS Frame Wiring / Cable Connections.

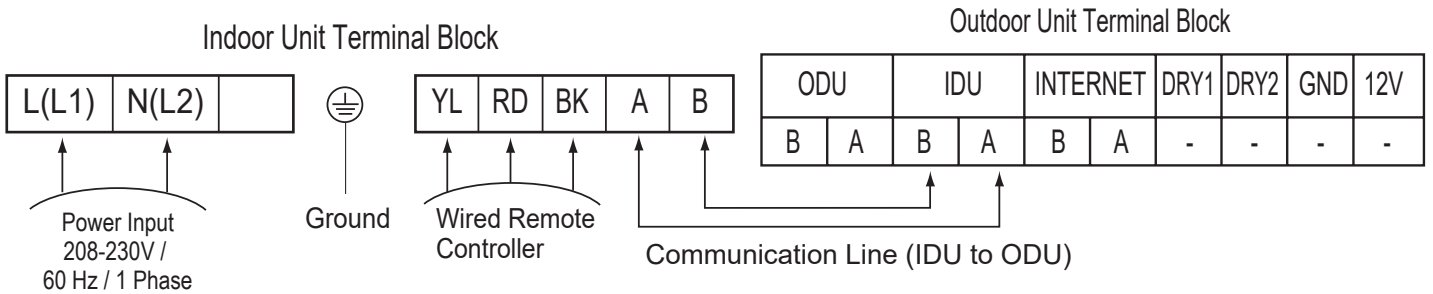
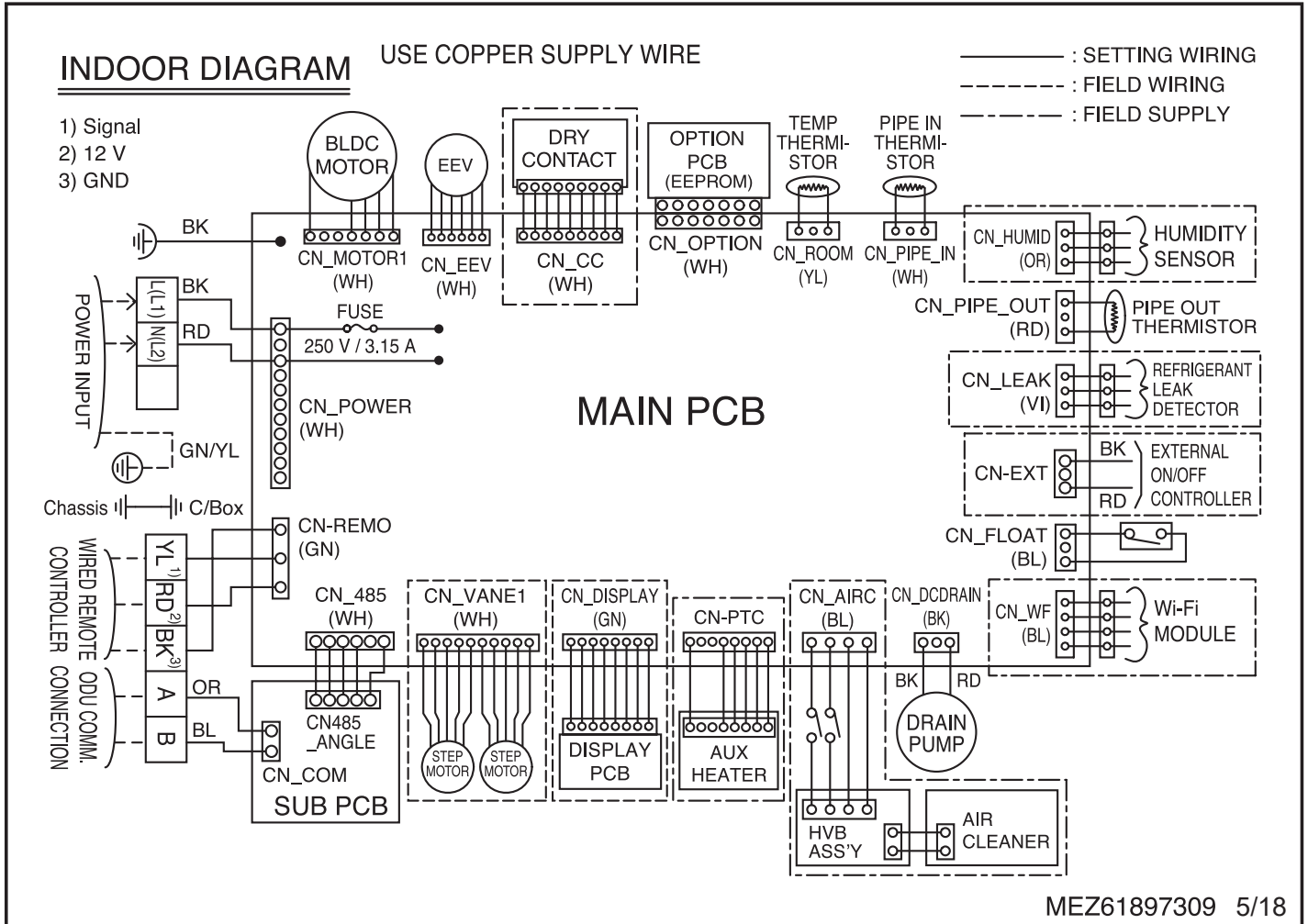


Figure 51: TS Frame Wiring Diagram.



Two-Way Cassette TS Frame

Table 15: TS Frame Wiring Diagram Legend.

Terminal	Purpose	Function
CN-MOTOR1	Fan motor output	Motor output of BLDC
CN-EEV	EEV Output	EEV Control output
CN-CC	Dry Contact	Dry Contact
CN-OPTION	Option PCB (EEPROM)	Option PCB connection
CN-ROOM	Room sensor	Room air thermistor
CN-PIPE_IN	Suction pipe sensor	Pipe in thermistor
CN-HUMID	N/A	N/A
CN-PIPE_OUT	Discharge pipe sensor	Pipe out thermistor
CN-LEAK	Leak sensor	Leak sensor connection
CN_EXT	External on/off controller	External on/off controller connection
CN-FLOAT	Float switch input	Float switch sensing
CN_WF	Wi-Fi module	Wi-Fi module connection
CN_DCDRAIN	Drain pump output	AC output for drain pump
CN-AIRC	N/A	N/A
CN-PTC	Auxiliary heater	Auxiliary heater connection
CN-DISPLAY	Display	Display of indoor status
CN-VANE1	Step Motor	Step motor output
CN-485	Communication	Connection between indoor and outdoor units
CN-COM	Communication	Connection on Sub PCB between indoor and outdoor units
CN-REMO	Remote controller	Remote control line
CN-POWER	AC Power supply	AC Power line input for indoor controller

Table 16: TS Frame DIP Switch Settings.

DIP Switch Setting		Off	On	Remarks
SW3	GROUP CONTROL	Master	Slave	Group control setting using 7-Day Programmable Controller; selects Master/ Slave on each indoor unit
SW4	DRY CONTACT MODE	Variable	Auto	Sets operation mode for optional Dry Contact accessory 1. Variable: Auto or Manual Mode can be set through 7-Day Programmable Controller or Wireless Remote Controller (factory default setting is Auto if there is no setting) 2. Auto: For Dry Contact, it is always Auto mode

***For Gen 4 Multi V two-way ceiling cassette indoor units, DIP switches 1, 2, 5 through 8 must be set to OFF. These DIP switches are used for other models.**

****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 52: Typical Four-Way Cassette Wiring / Cable Routing.

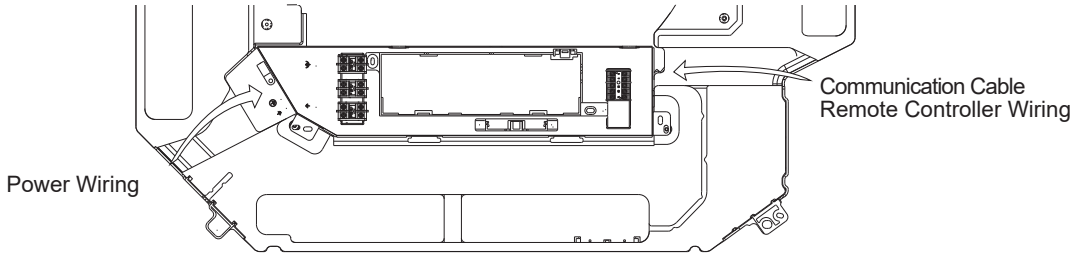


Figure 53: Typical Four-Way Cassette Wiring / Cable Routing, Side View.

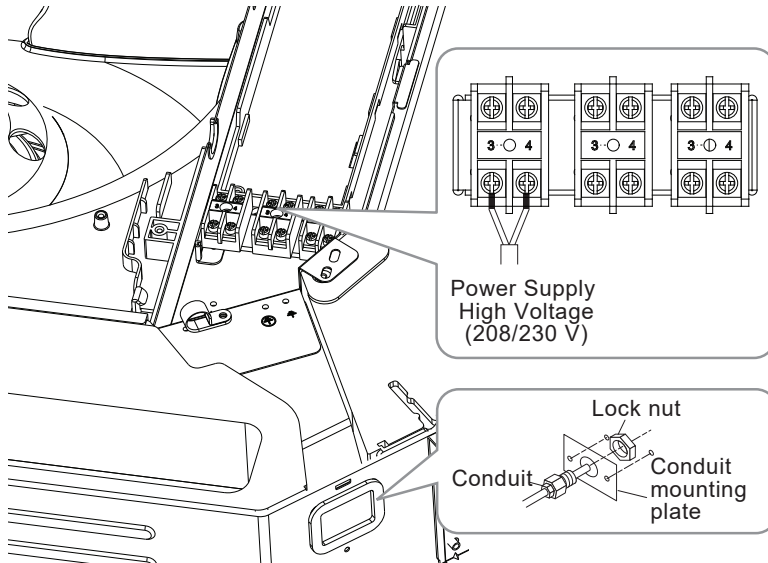
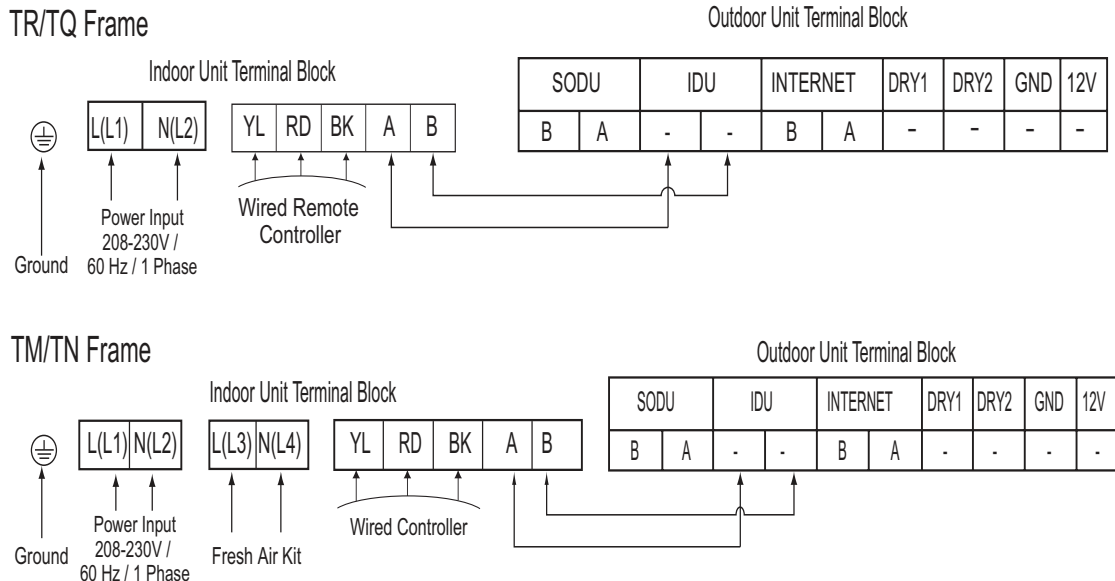
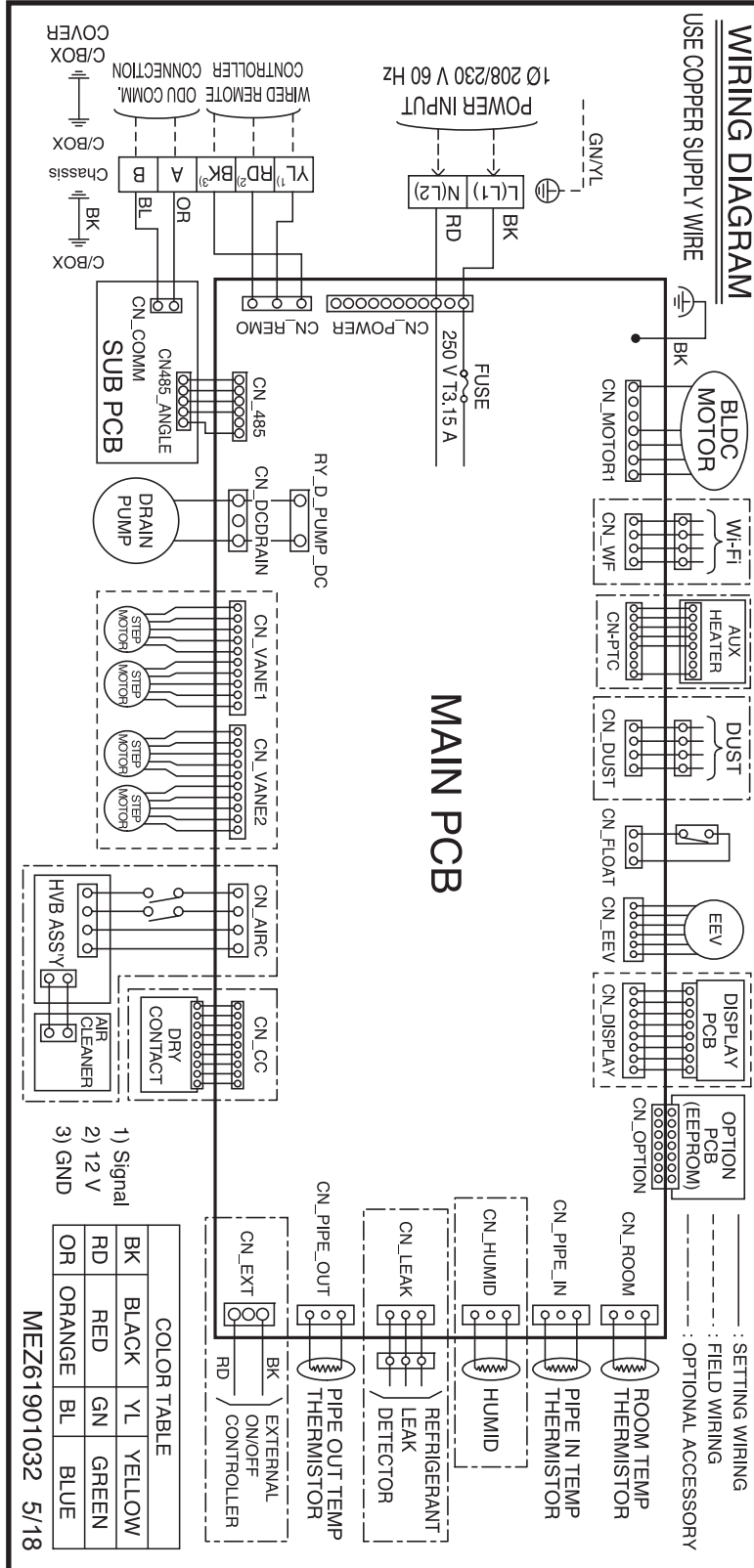


Figure 54: Four-Way Ceiling-Cassette Wiring / Cable Connections.



Four-Way Cassette TR and TQ Frame

Figure 55: TR, TQ Frame Wiring Diagram.



Four-Way Cassette TR and TQ Frame

Table 17: TR / TQ Frame Wiring Diagram Legend.

Terminal	Purpose	Function
CN_MOTOR1	Fan motor output	Motor output of BLDC
CN_WF	Wi-Fi module	Wi-Fi module connection
CN-PTC	Auxiliary heater	Auxiliary heater connection
CN_DUST	N/A	N/A
CN_FLOAT	Float switch input	Float switch sensing
CN_EEV	EEV output	EEV control output
CN_DISPLAY	Display	Display of indoor status
CN_OPTION	Option PCB (EEPROM)	Option PCB connection
CN_ROOM	Room sensor	Room air thermistor
CN_PIPE_IN	Suction pipe sensor	Pipe in thermistor
CN_HUMID	N/A	N/A
CN_LEAK	Leak sensor	Leak sensor connection
CN_PIPE_OUT	Discharge pipe sensor	Pipe out thermistor
CN_EXT	External on/off controller	External on/off controller connection
CN_CC	Dry Contact	Connection to Dry Contact (Optional)
CN_AIRC*	Air cleaner	Air cleaner control
CN_VANE2	Step Motor	Step motor output
CN_VANE1	Step Motor	Step motor output
CN_DCDRAIN	Drain pump output	AC output for drain pump
CN_485	Communication	Connection between indoor and outdoor units
CN_COMM	Communication	Connection on Sub PCB between indoor and outdoor units
CN_REMO	Remote controller	Remote control connection
CN_POWER	AC Power supply	AC power line input for indoor controller

Table 18: TR / TQ Frame DIP Switch Settings.

DIP Switch Setting		Off	On	Remarks
SW3	GROUP CONTROL	Master	Slave	Group control setting using 7-Day Programmable Controller; selects Master / Slave on each indoor unit
SW4	DRY CONTACT MODE	Variable	Auto	Sets operation mode for optional Dry Contact accessory 1. Variable: Auto or Manual Mode can be set through 7-Day Programmable Controller or Wireless Remote Controller (factory default setting is Auto if there is no setting) 2. Auto: For Dry Contact, it is always Auto mode
SW7	VENTILATOR INTERLOCK	Off	On	Selects ventilator interlock function for four-way ceiling cassette indoor units. 1. On: Automatic (vent relay will be turned on after ten [10] seconds of indoor unit operation) 2. Off: Manual (ventilator needs to be set through the controller)

*For Gen 4 Multi V four-way ceiling cassette indoor units, DIP switches 1, 2, 5, 6, and 8 must be set to OFF. These DIP switches are used for other models.

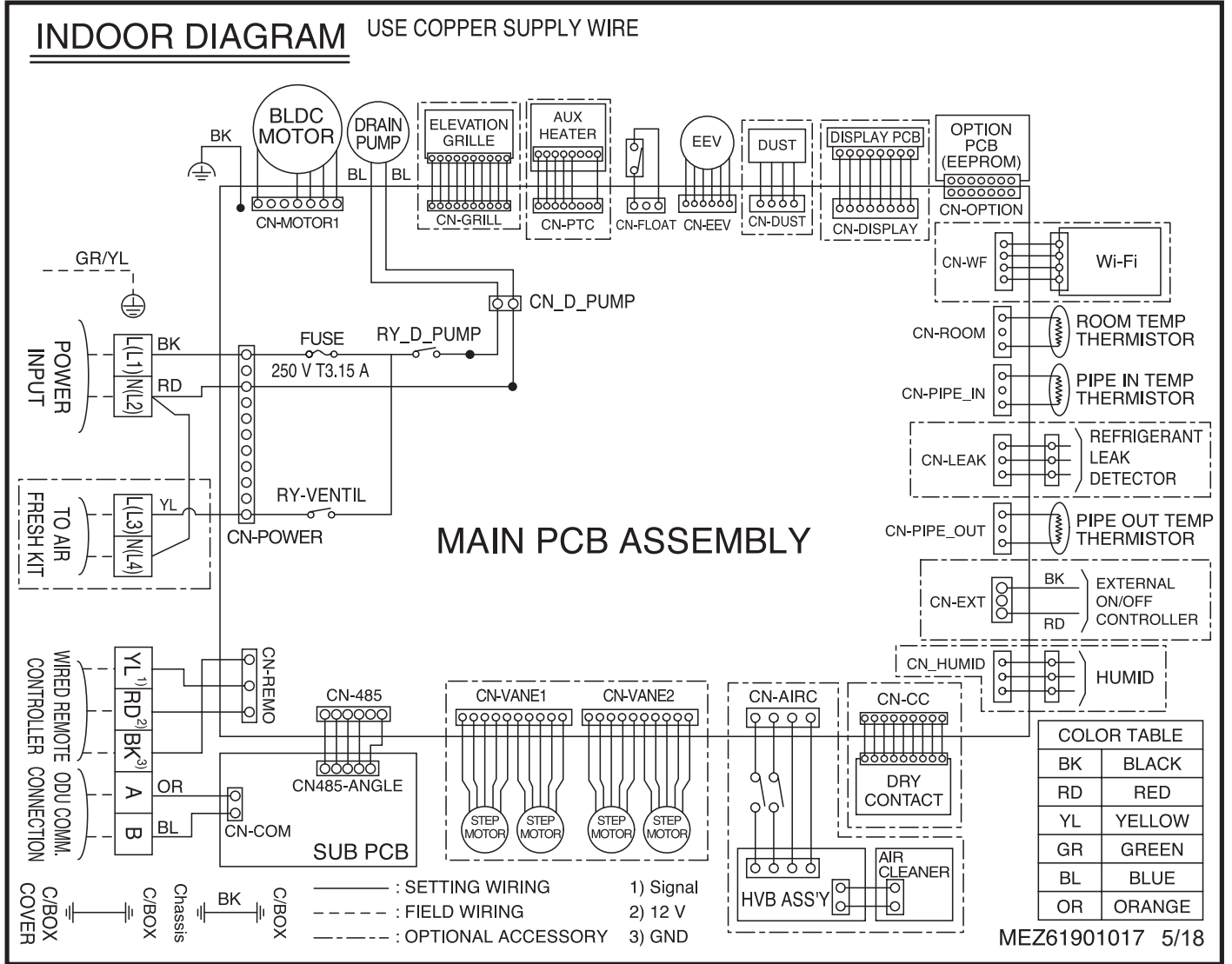
**To enable Generation 4 features, outdoor unit DIP switch no. 3 must be set to ON. Please refer to the Multi V 5, Multi V IV, Multi V Water IV, Multi V S Engineering Manual for additional information.

WIRING

Four-Way Cassette TN and TM Frame

Figure 56: TN and TM Frame Wiring Diagram.

MULTI V Ceiling Cassette Indoor Units



Four-Way Cassette TN and TM Frame

Table 19: TN and TM Frame Wiring Diagram Legend.

Terminal	Purpose	Function
CN-MOTOR1	Fan motor output	Motor output of BLDC
CN-D_PUMP	Drain pump output	AC output for drain pump
CN-GRILL	Elevation grille	Elevation grille connection
CN-PTC	Auxiliary heater	Auxiliary heater connection
CN-FLOAT	Float switch input	Float switch sensing
CN-EEV	EEV Output	EEV control output
CN-DUST	N/A	N/A
CN-DISPLAY	Display	Display of indoor status
CN-OPTION	Optional PCB EEPROM	Option PCB connection
CN-WF	Wi-Fi module	Wi-Fi module connection
CN-ROOM	Room sensor	Room air thermistor
CN-PIPE_IN	Suction pipe sensor	Pipe in thermistor
CN_LEAK	Leak sensor	Leak sensor connection
CN-PIPE_OUT	Discharge pipe sensor	Pipe out thermistor
CN-EXT	External on/off controller	External on/off controller connection
CN-HUMID	N/A	N/A
CN-CC	Dry contact	Dry Contact connection
CN-AIRC	Air cleaner	Air cleaner control
CN-VANE2	Step motor	Step motor output
CN-VANE1	Step motor	Step motor output
CN-485	Communication	Connection between indoor and outdoor units
CN-COM	Communication	Connection on Sub PCB between indoor and outdoor units
CN-REMO	Wired remote controller	Wired remote control connection
CN-POWER	AC Power supply	AC Power line

Table 20: TN and TM Frame DIP Switch Settings.

DIP Switch Setting		Off	On	Remarks
SW3	GROUP CONTROL	Master	Slave	Group control setting using 7-Day Programmable Controller; selects Master / Slave on each indoor unit
SW4	DRY CONTACT MODE	Variable	Auto	Sets operation mode for optional Dry Contact accessory 1. Variable: Auto or Manual Mode can be set through 7-Day Programmable Controller or Wireless Remote Controller (factory default setting is Auto if there is no setting) 2. Auto: For Dry Contact, it is always Auto mode
SW7	VENTILATOR INTERLOCK	Off	On	Selects ventilator interlock function for four-way ceiling cassette indoor units. 1. On: Automatic (vent relay will be turned on after ten [10] seconds of indoor unit operation) 2. Off: Manual (ventilator needs to be set through the controller)

***For Gen 4 Multi V four-way ceiling cassette indoor units, DIP switches 1, 2, 5, 6, and 8 must be set to OFF. These DIP switches are used for other models.**

****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

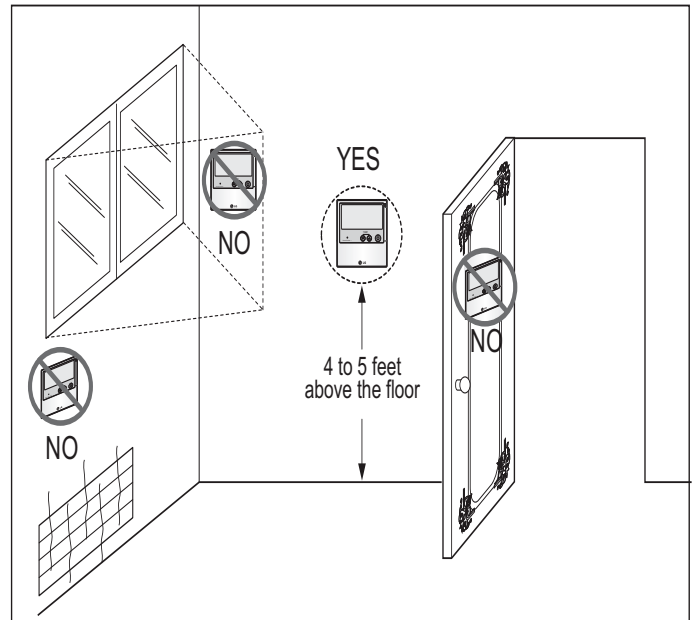
Wired Controller Installation

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 21: PRHR*3 Heat Recovery Unit to Air / Water Source Unit Compatibility.

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

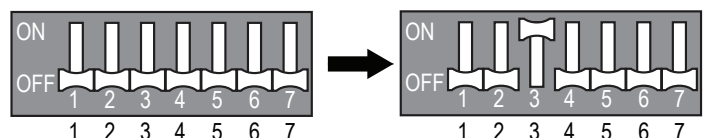
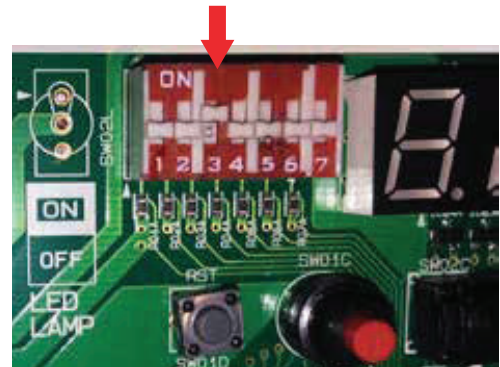
LG’s indoor units are designated Generation 4 (Gen 4). For Gen 4 indoor units to operate with Gen 4 indoor unit features, the air conditioning system must meet the following requirements:

- 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 57: Location and Setting of Outdoor Unit DIP Switch 3.

Air/Water Source Unit DIP Switch No. 3



Ceiling Height Setting

Set the airflow rate of the ceiling cassette indoor unit according to the height of the room's ceiling. Refer to the table below for ceiling height dimensions and the corresponding airflow setting. Use wired remote controller to make this setting. Refer to the wired remote controller's manual for instructions. The wired remote controller must be compatible with Generation 4 indoor units.

Table 22: Ceiling Height Settings.

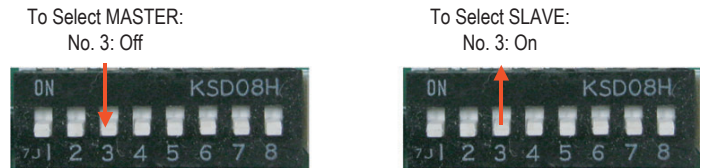
Ceiling Height		Setting Value	Description
5.5 to 28 kBtu Units	36 to 48 kBtu Units		
Up to 7 feet 6 inches	Up to 8 feet 11 inches	1	Decreases airflow 1 step below standard
From 7 feet 6 inches up to 8 feet 11 inches	From 8 feet 11 inches up to 10 feet 6 inches	2	Standard airflow rate for the unit
From 8 feet 11 inches up to 10 feet 3 inches	From 10 feet 6 inches up to 11 feet 10 inches	3	Increases airflow 1 step above standard
From 10 feet 3 inches up to 11 feet 10 inches	From 11 feet 10 inches up to 13 feet 10 inches	4	Increases airflow 2 steps above standard

DIP Switch Settings

See the following 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.) To ensure the remaining switches are set correctly, refer to the appropriate unit's DIP switch settings in the wiring section of this manual.

- 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.

Figure 58: Cassette Indoor Unit Master / Slave DIP Switch Settings.



Indoor Unit Control Configurations

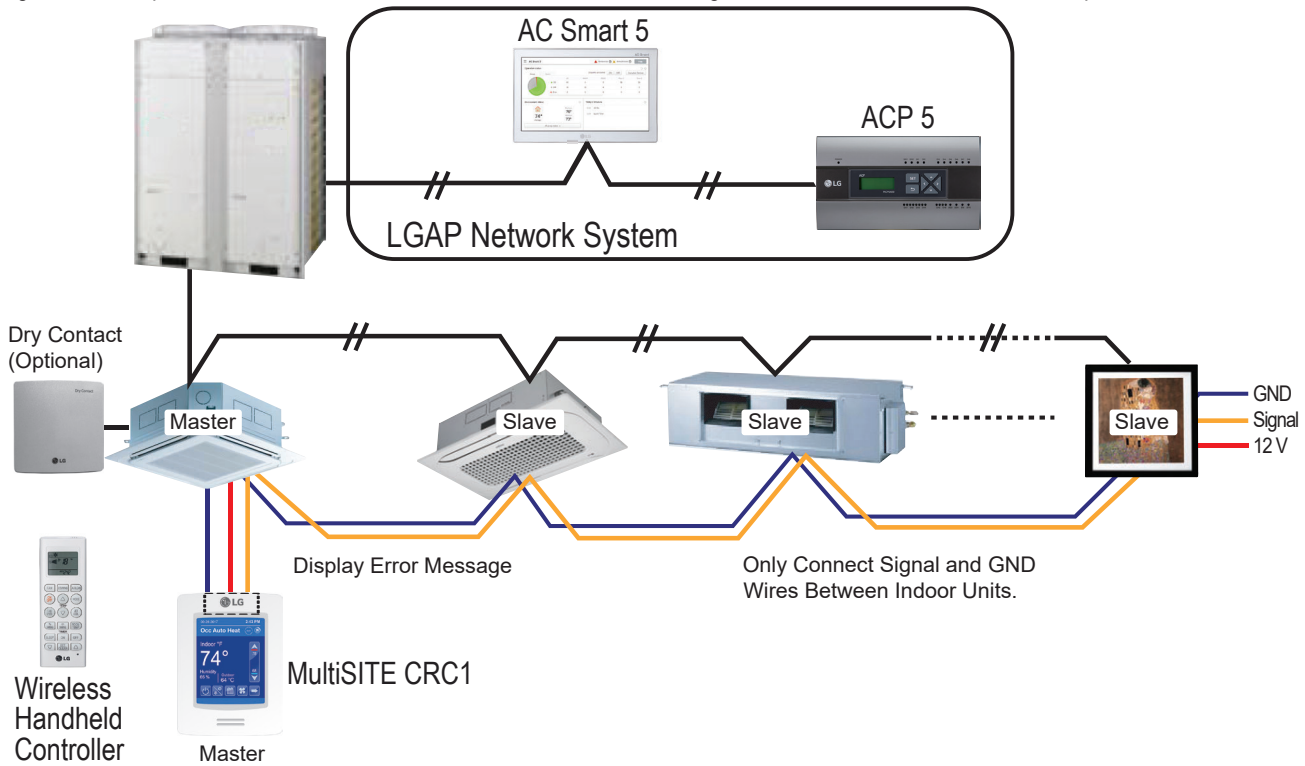
The method and configuration of controlling indoor units will vary according to system requirements, and the indoor unit(s) installed. The next few pages show examples of typical control configurations. Some configurations require LG group control kits and cables (sold separately); contact your LG representative for information.

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 changes
 - 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. See DIP Switch settings below.
- 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, continued.

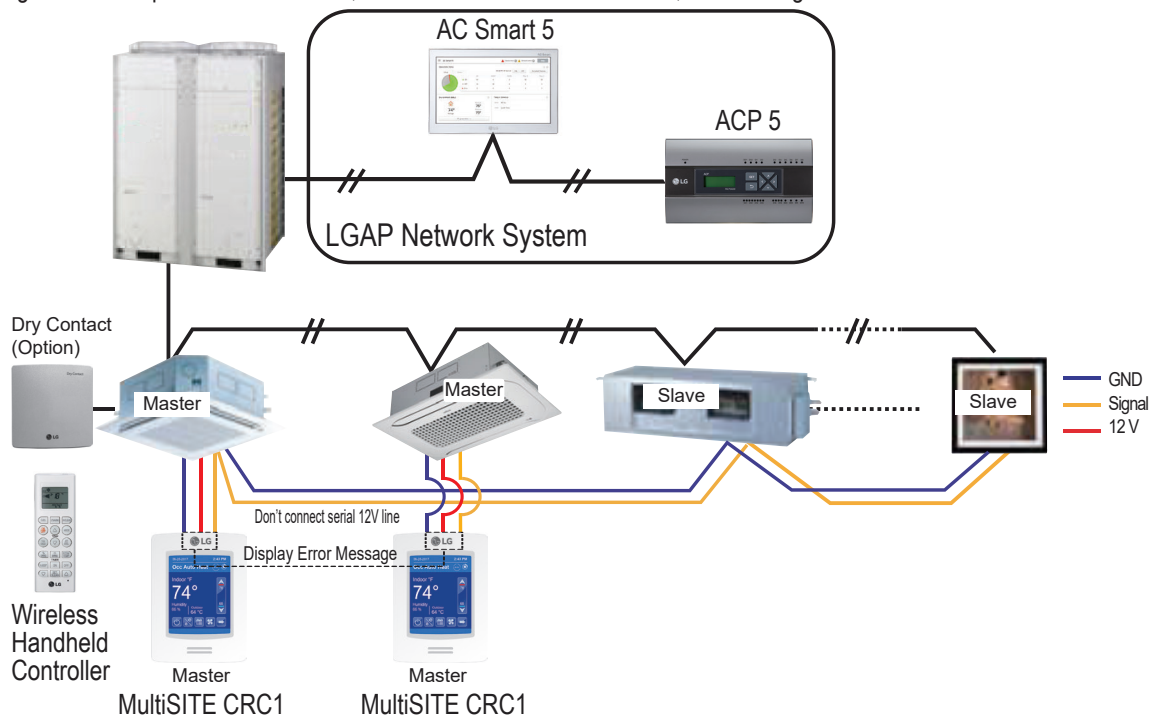
Figure 59: Group Control - Method 1, One Wired Remote Controller Configured as a Master for Indoor Unit Group Control.



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



Group Control - Method 3

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

Figure 61: Group Control - Method 3, Standard Indoor Units and Outside Air Units Configured as Two Groups, Each with a Master Wired Controller.

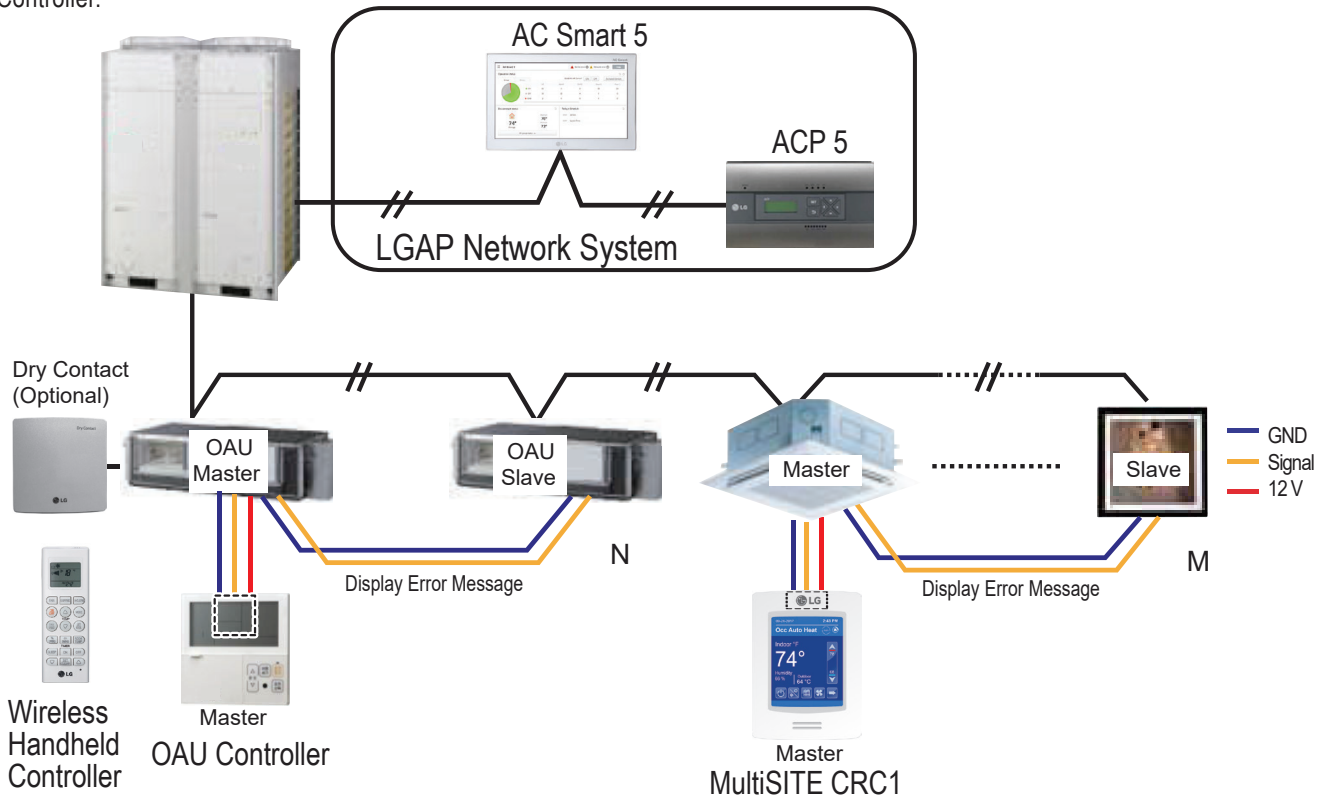
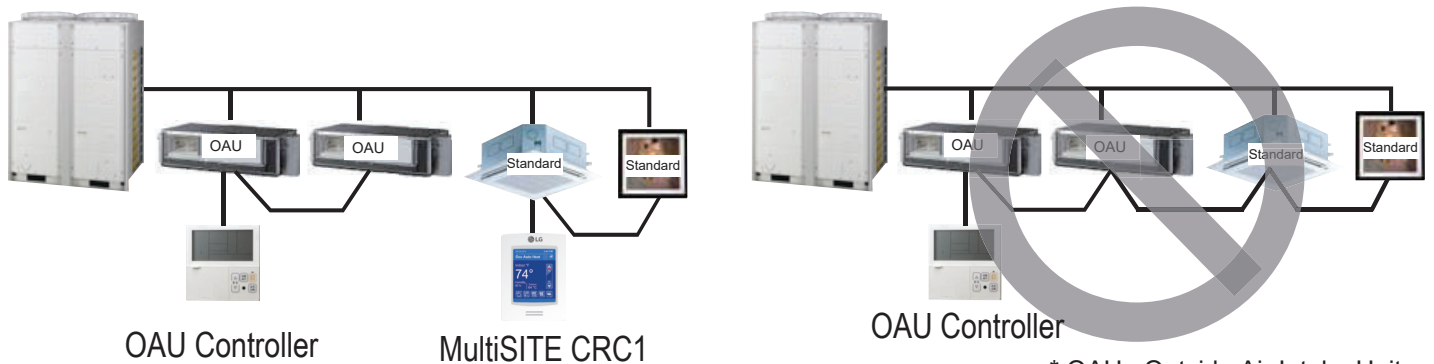


Figure 62: Correct and Incorrect Group Control Configuration with Standard Indoor Units and Outside Air Units.



* OAU : Outside Air Intake Unit
Standard: Standard Indoor Unit

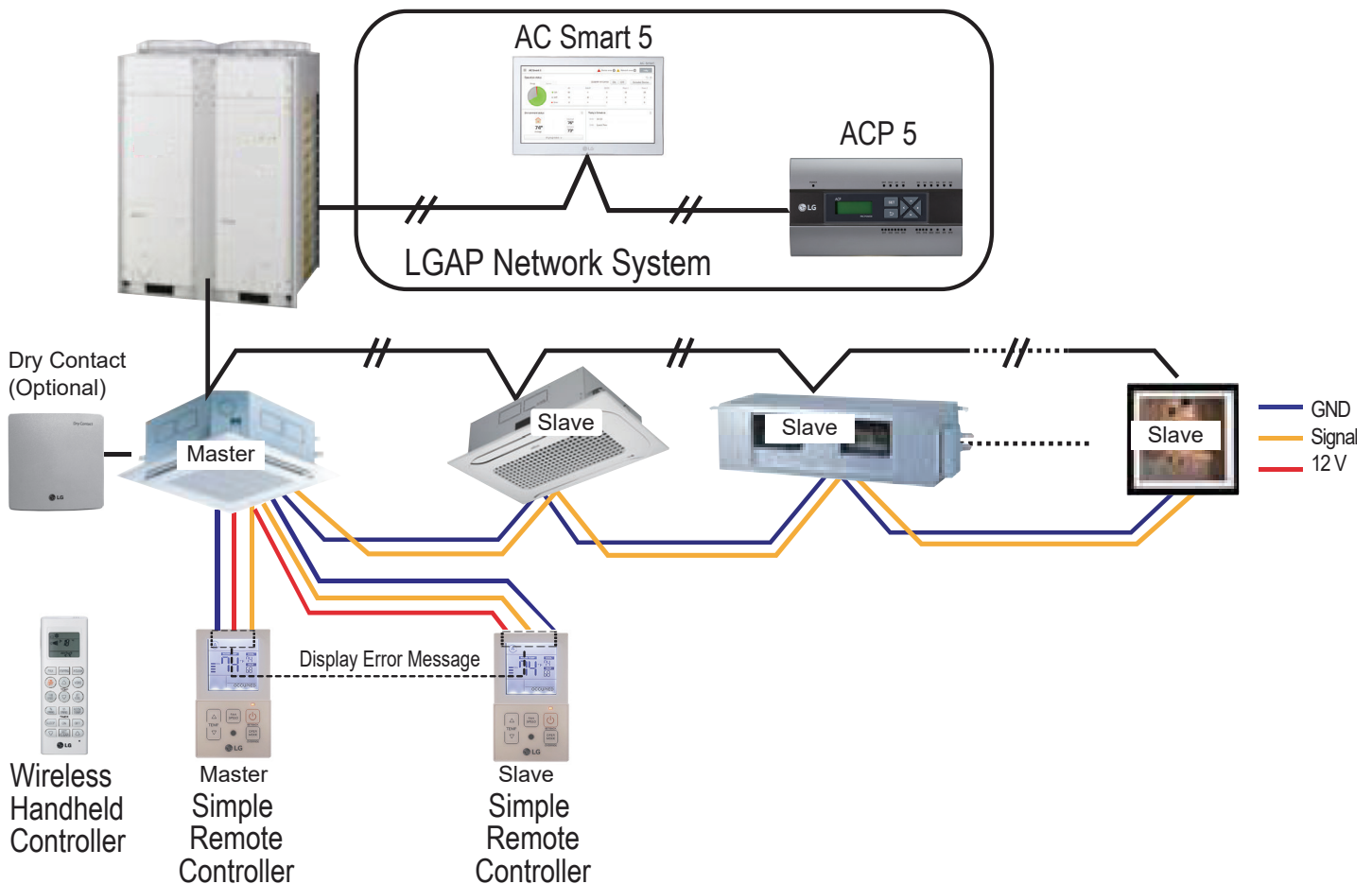
Group Control - Method 4

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.

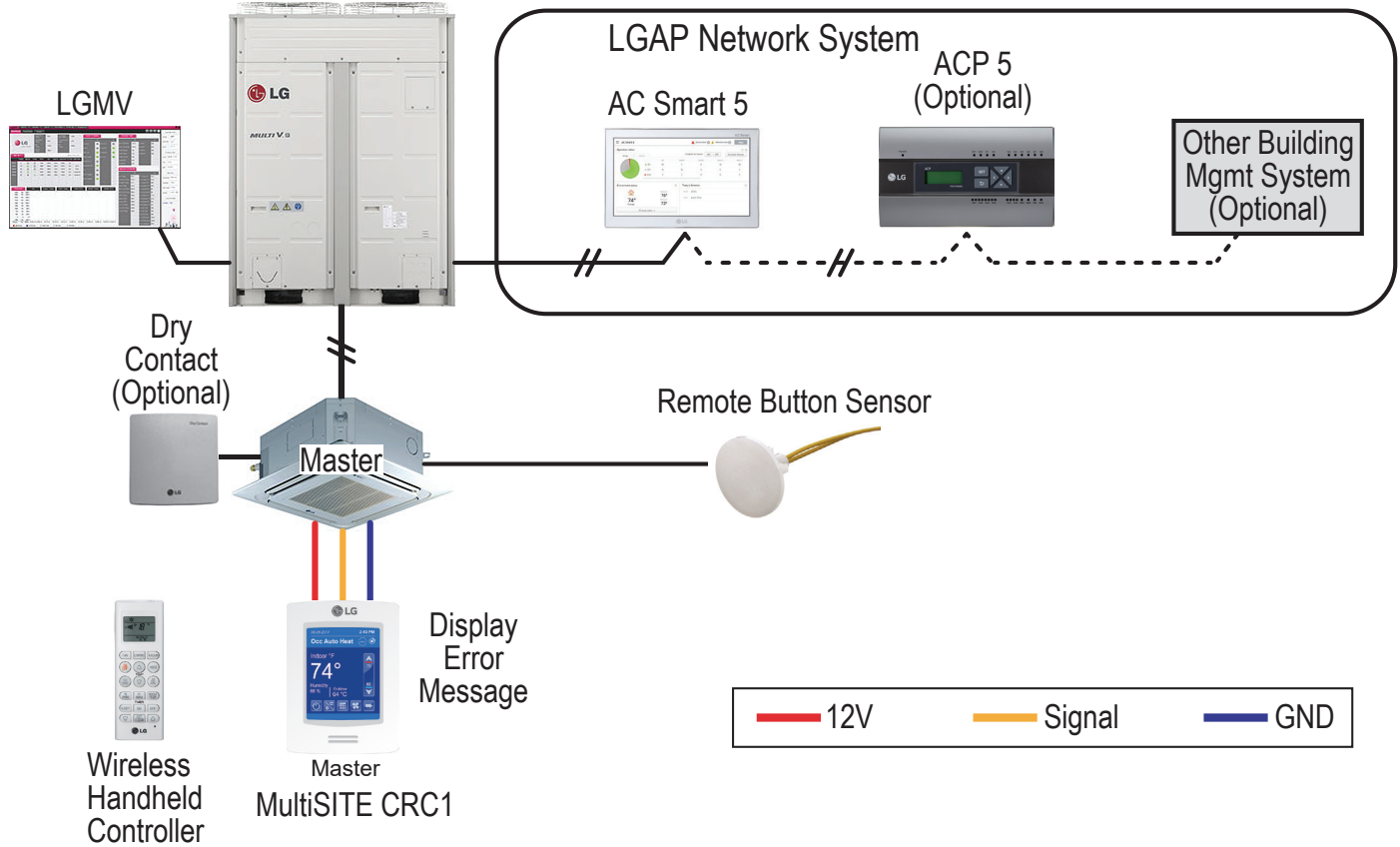
Figure 63: Group Control - Method 4, Two Simple Remote Controllers Connected to One Indoor Unit.



Remote Control

Figure below shows an example of a remote control configuration.

Figure 64: Remote Control.



MULTI V Ceiling Cassette Indoor Units

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 1/50 to 1/100 slope 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 27-9/16 inches from the bottom of the indoor unit (depends on model).	
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



LG Electronics, U.S.A., Inc.
Air Conditioning Technologies
4300 North Point Parkway
Alpharetta, Georgia 30022
www.lghvac.com

IM_MultiV_CeilingCassette_IDU_6_20
IM_MultiV_CeilingCassette_IDU_11_19
Supersedes: IM_MultiV_CeilingCassette_IDU_9_16
IM_MultiV_CeilingCassette_IDU_2_16
IM-MultiV-IV-CeilingCassette-01-15