LG
Life's Good

MULTI V™

CEILING CASSETTE INDOOR UNIT

INSTALLATION MANUAL

1-Way Models:

- ARNU073TUC4
- ARNU093TUC4
- ARNU123TUC4
- ARNU183TTC4
- ARNU243TTC4

2-Way Models:

- ARNU183TLC4
- ARNU243TLC4

4-Way 2' x 2' Models:

- ARNU053TRC4
- ARNU073TRC4
- ARNU093TRC4
- ARNU123TRC4
- ARNU153TQC4
- ARNU183TQC4

4-Way 3' x 3' Models:

- ARNU243TPC4
- ARNU283TPC4
- ARNU363TNC4
- ARNU423TMC4
- ARNU483TMC4
- ARNU073TNA4
- ARNU093TNA4
- ARNU123TNA4
- ARNU153TNA4
- ARNU183TNA4
- ARNU243TNA4
- ARNU243TMA4
- ARNU283TMA4
- ARNU363TMA4

PROPRIETARY DATA NOTICE

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

Please read carefully and store in a safe place for future reference.
Content familiarity required for proper installation.

The instructions included in this manual must be followed to prevent product malfunction, property damage, injury, or death to the user or other people. Incorrect operation due to ignoring any instructions will cause harm or damage. A summary of safety precautions begins on page 4.

For more technical materials such as submittals, engineering databooks, and catalogs, visit www.lghvac.com.

IM_MultiV_CeilingCassette_IDU_9_16

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

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, remove, or re-install 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.

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

⚠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.

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OPERATION

⚠DANGER

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

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

Use a dedicated power source for this product.

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

⃠ Do not operate the disconnect switch with wet hands.

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

Periodically verify the hanging bolts and other hardware securing the unit have not deteriorated.

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

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

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

⚠WARNING

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

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

Avoid excessive cooling and periodically perform ventilation to the unit.

Inadequate ventilation is a health hazard.

⃠ Do not touch the refrigerant piping during or after operation.

It can cause burns or frostbite.

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

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

Periodically check power cable and connection for damage.

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

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

⃠ Do not operate the unit with the panels or guards removed. ⃠ Do not 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.

⚠CAUTION

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

Note:

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

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

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

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

⃠ Do not block the inlet or outlet.

Unit may malfunction.

Securely attach the electrical cover to the indoor unit. Non-secured covers can result in fire due to dust or water in the service panel.

Periodically verify the equipment mounts have not deteriorated.

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

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

There is risk of unit failure.

Ceiling Cassette Indoor Units

This manual describes how to install the LG 4-Way, 2-Way, and 1-Way Ceiling Cassette indoor units (IDU) for Multi V Variable Refrigerant Flow (VRF) heat pump and heat recovery systems. Table 1 lists the available models. Refer to LG's Multi V Indoor Unit Engineering Manual for complete detailed engineering data and selection procedures.

Safety

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

Installation Personnel

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

Applicable Codes

Personnel must be familiar with and follow the applicable national, state, and/or local codes.

⚠WARNING

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

Note:

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

Figure 1: 4-Way TQ, TR, TM, TN, TP Chassis

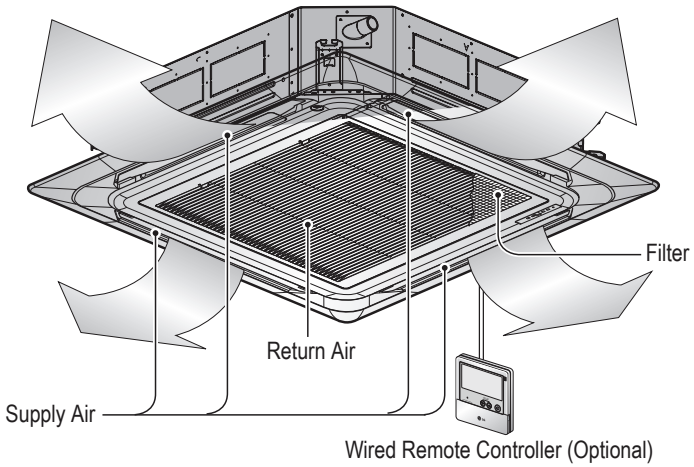


Figure 2: 2-Way TL Chassis

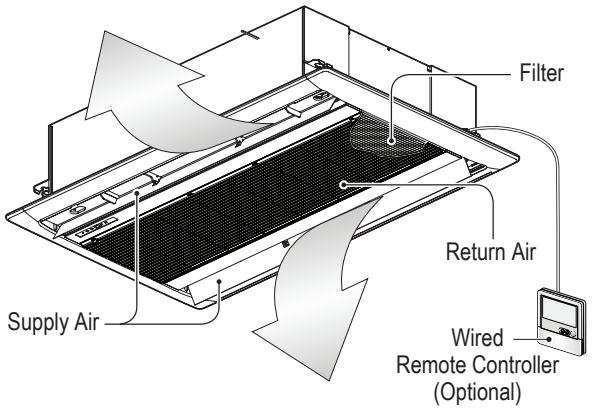
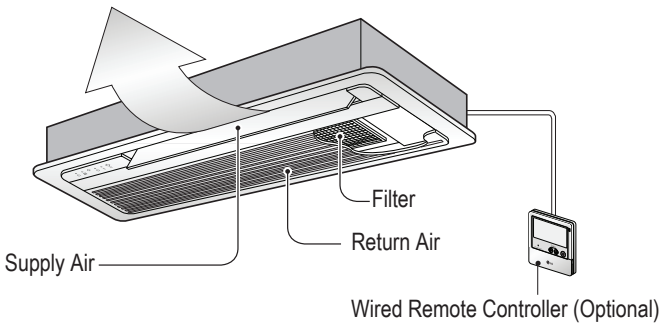


Figure 3: 1-Way TU, TT Chassis



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

Table 1: Multi V Cassette Indoor Units

Unit	Model Number
Ceiling Cassette: 4-Way (2' x 2') 	ARNU053TRC4
	ARNU073TRC4
	ARNU093TRC4
	ARNU123TRC4
	ARNU153TQC4
	ARNU183TQC4
Ceiling Cassette: 4-Way (3' x 3') 	ARNU243TPC4
	ARNU283TPC4
	ARNU363TNC4
	ARNU423TMC4
	ARNU483TMC4
	ARNU073TNA4
	ARNU093TNA4
	ARNU123TNA4
	ARNU153TNA4
	ARNU183TNA4
	ARNU243TNA4
	ARNU243TMA4
	ARNU283TMA4
	ARNU363TMA4
Ceiling Cassette: 2-Way 	ARNU183TLC4
	ARNU243TLC4
Ceiling Cassette 1-Way 	ARNU073TUC4
	ARNU093TUC4
	ARNU123TUC4
	ARNU183TTC4
	ARNU243TTC4

Cassette Indoor Units Nomenclature

Family

ARN = Multi V Indoor Unit (Refrigerant R410A)

Type

U = Inverter Heat Pump

Nominal Capacity
(Nominal cooling capacity in Btu/h)

05 = 5,500	15 = 15,400	36 = 36,200
07 = 7,500	18 = 19,100	42 = 42,000
09 = 9,600	24 = 24,200	48 = 48,000
12 = 12,300	28 = 28,000	

Electrical Ratings

3 = 208–230V/60Hz/1Phase

Chassis/Model Type

TP = 4-Way Ceiling Cassette (3'x3')	TR = 4-Way Ceiling Cassette (2'x2')	TL = 2-Way Ceiling Cassette
TN = 4-Way Ceiling Cassette (3'x3')	TQ = 4-Way Ceiling Cassette (2'x2')	TU = 1-Way Ceiling Cassette
TM = 4-Way Ceiling Cassette (3'x3')		TT = 1-Way Ceiling Cassette

Feature

A, C, L, R = Standard

Plasma Filter (Plasma filter kits are available separately for four-way cassette IDUs. Always follow all local, state, and national building codes with the use of this or any product.)

Generation

4 = Fourth

R410A REFRIGERANT

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

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

⚠WARNING

- *To prevent the refrigerant cylinder from exploding, do not place it in direct sunlight.*
- *Do not use any piping that has not been approved for use in high-pressure refrigerant systems.*
- *To prevent the piping from softening, do not heat it more than necessary during installation.*
- *Piping wall thickness must comply with the applicable local, state, and federal codes for the 551 psi design pressure of R410A.*

⚠ *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.*

Table 2: 4-Way Cassette Indoor Units Specifications

Type	4-Way Ceiling Cassette – 2 ft x 2 ft Models – TR/TQ Chassis					
	ARNU053TRC4	ARNU073TRC4	ARNU093TRC4	ARNU123TRC4	ARNU153TQC4	ARNU183TQC4
Cooling Mode Performance						
Capacity (Btu/h)	5,500	7,500	9,600	12,300	15,400	19,100
Power Input[1] (W)	30	30	30	30	30	30
Heating Mode Performance						
Capacity (Btu/h)	6,100	8,500	10,900	13,600	17,100	21,500
Power Input[1] (W)	30	30	30	30	30	30
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
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)	11	11	11	11	11	11
Communication Cable[3] (No. x AWG)	2 x 18	2 x 18	2 x 18	2 x 18	2 x 18	2 x 18
Fan						
Quantity	1	1	1	1	1	1
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, OD)	1/4 Flare	1/4 Flare	1/4 Flare	1/4 Flare	1/4 Flare	1/4 Flare
Vapor Line (in, OD)	1/2 Flare	1/2 Flare	1/2 Flare	1/2 Flare	1/2 Flare	1/2 Flare
Condensate Line (in, ID)	1	1	1	1	1	1

[1]Power Input is rated at high speed.

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

[3]All communication cable to be minimum 18 AWG, 2-conductor, stranded, shielded and must comply with applicable local and national codes. Ensure the communication cable is properly grounded at the master outdoor unit only. Do not ground the ODU−IDU communications cable at any other point.

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes. Power Supply (V/Hz/Ø): 208-230/60/1

This unit comes with a dry nitrogen charge.

This data is rated 0 ft above sea level, with 25 ft of refrigerant line per indoor unit and a 0 ft level difference between outdoor and indoor units. All capacities are net with a combination ratio between 95-105%.

Cooling capacity rating obtained with air entering the indoor coil at 80ºF dry bulb (DB) and 67ºF wet bulb (WB) and outdoor ambient conditions of 95ºF dry bulb (DB).

Heating capacity rating obtained with air entering the indoor unit at 70ºF dry bulb (DB) and outdoor ambient conditions of 47ºF dry bulb (DB) and 43ºF wet bulb (WB).

GENERAL DATA

Specifications

Table 2: 4-Way Cassette Indoor Units Specifications – continued

Type	4-Way Ceiling Cassette – 3 ft x 3 ft Models – TP, TN, TM Chassis				
	ARNU243TPC4	ARNU283TPC4	ARNU363TNC4	ARNU423TMC4	ARNU483TMC4
Cooling Mode Performance					
Capacity (Btu/h)	24 200	28 000	36 200	42 000	48 100
Power Input[1] (W)	33	33	144	144	144
Heating Mode Performance					
Capacity (Btu/h)	27 300	31 500	40 600	43 800	51 200
Power Input[1] (W)	33	33	144	144	144
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
Net Unit Weight (lbs)	48	48	54	59	59
Shipping Weight (lbs)	58	58	64	69	69
Grille Weight (lbs)	13	13	13	13	13
Grille Shipping Weight (lbs)	20	20	20	20	20
Communication Cable[3] (No. x AWG)	2 x 18	2 x 18	2 x 18	2 x 18	2 x 18
Fan					
Quantity	1	1	1	1	1
Airflow Rate H/M/L (CFM)	600 / 530 / 459	671 / 565 / 494	883 / 777 / 706	1059 / 918 / 812	1130 / 953 / 883
Piping					
Liquid Line (in, OD)	3/8 Flare	3/8 Flare	3/8 Flare	3/8 Flare	3/8 Flare
Vapor Line (in, OD)	5/8 Flare	5/8 Flare	5/8 Flare	5/8 Flare	5/8 Flare
Condensate Line (in, ID)	1	1	1	1	1

[1]Power Input is rated at high speed.

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

[3]All communication cable to be minimum 18 AWG, 2-conductor, stranded, shielded and must comply with applicable local and national codes. Ensure the communication cable is properly grounded at the master outdoor unit only. Do not ground the ODU−IDU communications cable at any other point.

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes. Power Supply (V/Hz/Ø): 208-230/60/1

This unit comes with a dry nitrogen charge.

This data is rated 0 ft above sea level, with 25 ft of refrigerant line per indoor unit and a 0 ft level difference between outdoor and indoor units. All capacities are net with a combination ratio between 95-105%.

Cooling capacity rating obtained with air entering the indoor coil at 80ºF dry bulb (DB) and 67ºF wet bulb (WB) and outdoor ambient conditions of 95ºF dry bulb (DB).

Heating capacity rating obtained with air entering the indoor unit at 70ºF dry bulb (DB) and outdoor ambient conditions of 47ºF dry bulb (DB) and 43ºF wet bulb (WB).

Table 2: 4-Way Cassette Indoor Units Specifications – continued

Type	4-Way Ceiling Cassette – 3 ft x 3 ft Models – TP, TN, TM Chassis				
	ARNU073TNA4	ARNU093TNA4	ARNU123TNA4	ARNU153TNA4	ARNU183TNA4
Cooling Mode Performance					
Capacity (Btu/h)	7 500	9 600	12 300	15 400	19 100
Power Input[1] (W)	144	144	144	144	144
Heating Mode Performance					
Capacity (Btu/h)	8 500	10 900	13 600	17 100	21 500
Power Input[1] (W)	144	144	144	144	144
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
Net Unit Weight (lbs)	53.6	53.6	53.6	53.6	53.6
Shipping Weight (lbs)	66.1	66.1	66.1	66.1	66.1
Grille Weight (lbs)	13	13	13	13	13
Grille Shipping Weight (lbs)	20	20	20	20	20
Communication Cable[3] (No. x AWG)	2 x 18	2 x 18	2 x 18	2 x 18	2 x 18
Fan					
Quantity	1	1	1	1	1
Airflow Rate H/M/L (CFM)	459 / 424 / 388	477 / 424 / 388	494 / 459 / 424	530 / 459 / 424	565 / 530 / 424
Piping					
Liquid Line (in, OD)	3/8 Flare	3/8 Flare	3/8 Flare	3/8 Flare	3/8 Flare
Vapor Line (in, OD)	5/8 Flare	5/8 Flare	5/8 Flare	5/8 Flare	5/8 Flare
Condensate Line (in, ID)	1	1	1	1	1

[1]Power Input is rated at high speed.

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

[3]All communication cable to be minimum 18 AWG, 2-conductor, stranded, shielded and must comply with applicable local and national codes. Ensure the communication cable is properly grounded at the master outdoor unit only. Do not ground the ODU−IDU communications cable at any other point.

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes. Power Supply (V/Hz/Ø): 208-230/60/1

This unit comes with a dry nitrogen charge.

This data is rated 0 ft above sea level, with 25 ft of refrigerant line per indoor unit and a 0 ft level difference between outdoor and indoor units. All capacities are net with a combination ratio between 95-105%.

Cooling capacity rating obtained with air entering the indoor coil at 80ºF dry bulb (DB) and 67ºF wet bulb (WB) and outdoor ambient conditions of 95ºF dry bulb (DB).

Heating capacity rating obtained with air entering the indoor unit at 70ºF dry bulb (DB) and outdoor ambient conditions of 47ºF dry bulb (DB) and 43ºF wet bulb (WB).

GENERAL DATA

Specifications

Table 2: 4-Way Cassette Indoor Units Specifications – continued

Type	4-Way Ceiling Cassette – 3 ft x 3 ft Models – TP, TN, TM Chassis			
	ARNU243TNA4	ARNU243TMA4	ARNU283TMA4	ARNU363TMA4
Cooling Mode Performance				
Capacity (Btu/h)	24 200	24 200	28 000	36 200
Power Input[1] (W)	144	144	144	144
Heating Mode Performance				
Capacity (Btu/h)	27 300	27 300	31 500	40 600
Power Input[1] (W)	144	144	144	144
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
Net Unit Weight (lbs)	53.6	58.4	58.4	58.4
Shipping Weight (lbs)	66.1	70.5	70.5	70.5
Grille Weight (lbs)	13	13	13	13
Grille Shipping Weight (lbs)	20	20	20	20
Communication Cable[3] (No. x AWG)	2 x 18	2 x 18	2 x 18	2 x 18
Fan				
Quantity	1	1	1	1
Airflow Rate H/M/L (CFM)	742 / 671 / 600	777 / 706 / 635	812 / 741 / 635	918 / 812 / 706
Piping				
Liquid Line (in, OD)	3/8 Flare	3/8 Flare	3/8 Flare	3/8 Flare
Vapor Line (in, OD)	5/8 Flare	5/8 Flare	5/8 Flare	5/8 Flare
Condensate Line (in, ID)	1	1	1	1

[1]Power Input is rated at high speed.

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

[3]All communication cable to be minimum 18 AWG, 2-conductor, stranded, shielded and must comply with applicable local and national codes. Ensure the communication cable is properly grounded at the master outdoor unit only. Do not ground the ODU−IDU communications cable at any other point.

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes. Power Supply (V/Hz/Ø): 208-230/60/1

This unit comes with a dry nitrogen charge.

This data is rated 0 ft above sea level, with 25 ft of refrigerant line per indoor unit and a 0 ft level difference between outdoor and indoor units. All capacities are net with a combination ratio between 95-105%.

Cooling capacity rating obtained with air entering the indoor coil at 80ºF dry bulb (DB) and 67ºF wet bulb (WB) and outdoor ambient conditions of 95ºF dry bulb (DB).

Heating capacity rating obtained with air entering the indoor unit at 70ºF dry bulb (DB) and outdoor ambient conditions of 47ºF dry bulb (DB) and 43ºF wet bulb (WB).

Table 2: 2-Way Cassette Indoor Units Specifications

Type	2-Way Ceiling Cassette – TL Chassis	
	ARNU183TLC4	ARNU243TLC4
Cooling Mode Performance		
Capacity (Btu/h)	19,100	24,200
Power Input[1] (W)	144	144
Heating Mode Performance		
Capacity (Btu/h)	21,500	27,300
Power Input[1] (W)	144	144
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
Net Unit Weight (lbs)	56	56
Shipping Weight (lbs)	66	66
Grille Weight (lbs)	13	13
Grille Shipping Weight (lbs)	20	20
Communication Cable[3] (No. x AWG)	2 x 18	2 x 18
Fan		
Quantity	1	1
Airflow Rate H/M/L (CFM)	565/530/424	742/671/600
Piping		
Liquid Line (in, OD)	3/8 Flare	3/8 Flare
Vapor Line (in, OD)	5/8 Flare	5/8 Flare
Condensate Line (in, ID)	1	1

[1]Power Input is rated at high speed.

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

[3]All communication cable to be minimum 18 AWG, 2-conductor, stranded, shielded and must comply with applicable local and national codes. Ensure the communication cable is properly grounded at the master outdoor unit only. Do not ground the ODU−IDU communications cable at any other point.

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes. Power Supply (V/Hz/Ø): 208-230/60/1

This unit comes with a dry nitrogen charge.

This data is rated 0 ft above sea level, with 25 ft of refrigerant line per indoor unit and a 0 ft level difference between outdoor and indoor units. All capacities are net with a combination ratio between 95-105%.

Cooling capacity rating obtained with air entering the indoor coil at 80ºF dry bulb (DB) and 67ºF wet bulb (WB) and outdoor ambient conditions of 95ºF dry bulb (DB).

Heating capacity rating obtained with air entering the indoor unit at 70ºF dry bulb (DB) and outdoor ambient conditions of 47ºF dry bulb (DB) and 43ºF wet bulb (WB).

GENERAL DATA

Specifications

Table 2: 1-Way Cassette Indoor Units Specifications

Type	1-Way Ceiling Cassette – TU, TT Chassis				
	ARNU073TUC4	ARNU093TUC4	ARNU123TUC4	ARNU183TTC4	ARNU243TTC4
Cooling Mode Performance					
Capacity (Btu/h)	7 500	9 600	12 300	19 100	24 200
Power Input[1] (W)	40	40	40	70	70
Heating Mode Performance					
Capacity (Btu/h)	8 500	10 900	13 600	21 500	24 200
Power Input[1] (W)	40	40	40	70	70
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
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[3] (No. x AWG)	2 x 18	2 x 18	2 x 18	2 x 18	2 x 18
Fan					
Quantity	1	1	1	1	1
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, OD)	1/4 Flare	1/4 Flare	1/4 Flare	1/4 Flare	3/8 Flare
Vapor Line (in, OD)	1/2 Flare	1/2 Flare	1/2 Flare	1/2 Flare	5/8 Flare
Condensate Line (in, ID)	1	1	1	1	1

[1]Power Input is rated at high speed.

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

[3]All communication cable to be minimum 18 AWG, 2-conductor, stranded, shielded and must comply with applicable local and national codes. Ensure the communication cable is properly grounded at the master outdoor unit only. Do not ground the ODU−IDU communications cable at any other point.

EEV: Electronic Expansion Valve

Power wiring is field supplied and must comply with the applicable local and national codes. Power Supply (V/Hz/Ø): 208-230/60/1

This unit comes with a dry nitrogen charge.

This data is rated 0 ft above sea level, with 25 ft of refrigerant line per indoor unit and a 0 ft level difference between outdoor and indoor units. All capacities are net with a combination ratio between 95-105%.

Cooling capacity rating obtained with air entering the indoor coil at 80ºF dry bulb (DB) and 67ºF wet bulb (WB) and outdoor ambient conditions of 95ºF dry bulb (DB).

Heating capacity rating obtained with air entering the indoor unit at 70ºF dry bulb (DB) and outdoor ambient conditions of 47ºF dry bulb (DB) and 43ºF wet bulb (WB).

Electrical Data

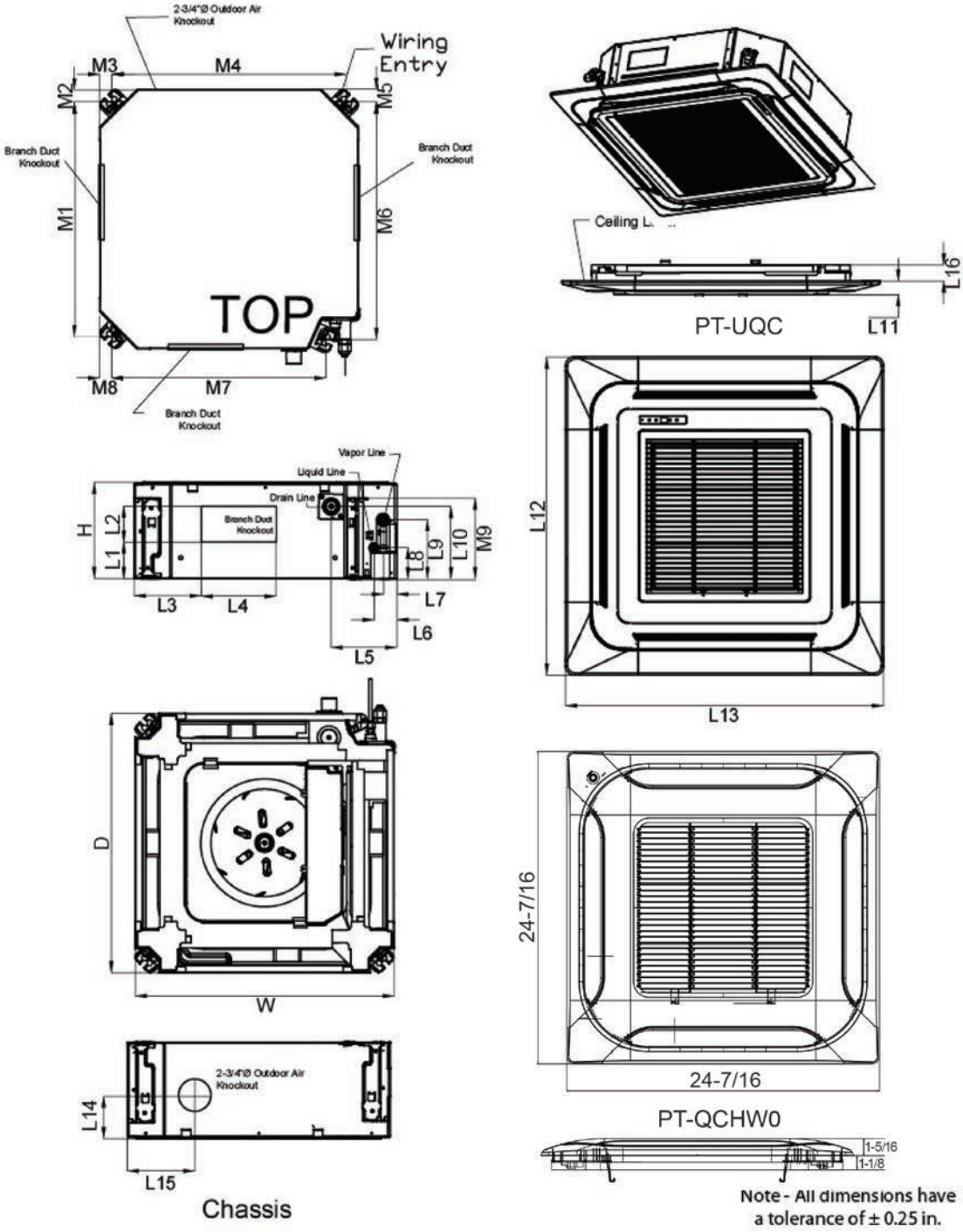
Table 3: Ceiling Cassette Indoor Units Electrical Data

Model	Voltage Range	MCA (A)	MOP (A)	Rated Amps (A)	Power Supply			Power Input (W)	
					Hz	Volts	Phase	Cooling	Heating
ARNU073TUC4		0.23		0.18				40	40
ARNU093TUC4		0.23		0.18				40	40
ARNU123TUC4		0.23		0.18				40	40
ARNU183TTC4		0.38		0.30				70	70
ARNU243TTC4		0.38		0.30				70	70
ARNU183TLC4		0.47		0.37				70	70
ARNU243TLC4		0.47		0.37				70	70
ARNU053TRC4		0.25		0.20				30	30
ARNU073TRC4		0.25		0.20				30	30
ARNU093TRC4		0.25		0.20				30	30
ARNU123TRC4		0.25		0.20				30	30
ARNU153TQC4		0.25		0.20				30	30
ARNU183TQC4		0.25		0.20				30	30
ARNU243TPC4	187-253	0.19	15	0.15	60	208-230	1	33	33
ARNU283TPC4		0.19		0.15				33	33
ARNU363TNC4		0.71		0.56				144	144
ARNU423TMC4		0.71		0.56				144	144
ARNU483TMC4		0.71		0.56				144	144
ARNU073TNA4		0.71		0.56				144	144
ARNU093TNA4		0.71		0.56				144	144
ARNU123TNA4		0.71		0.56				144	144
ARNU153TNA4		0.71		0.56				144	144
ARNU183TNA4		0.71		0.56				144	144
ARNU243TNA4		0.71		0.56				144	144
ARNU243TMA4		1.6		1.3				144	144
ARNU283TMA4		1.6		1.3				144	144
ARNU363TMA4		1.6		1.3				144	144

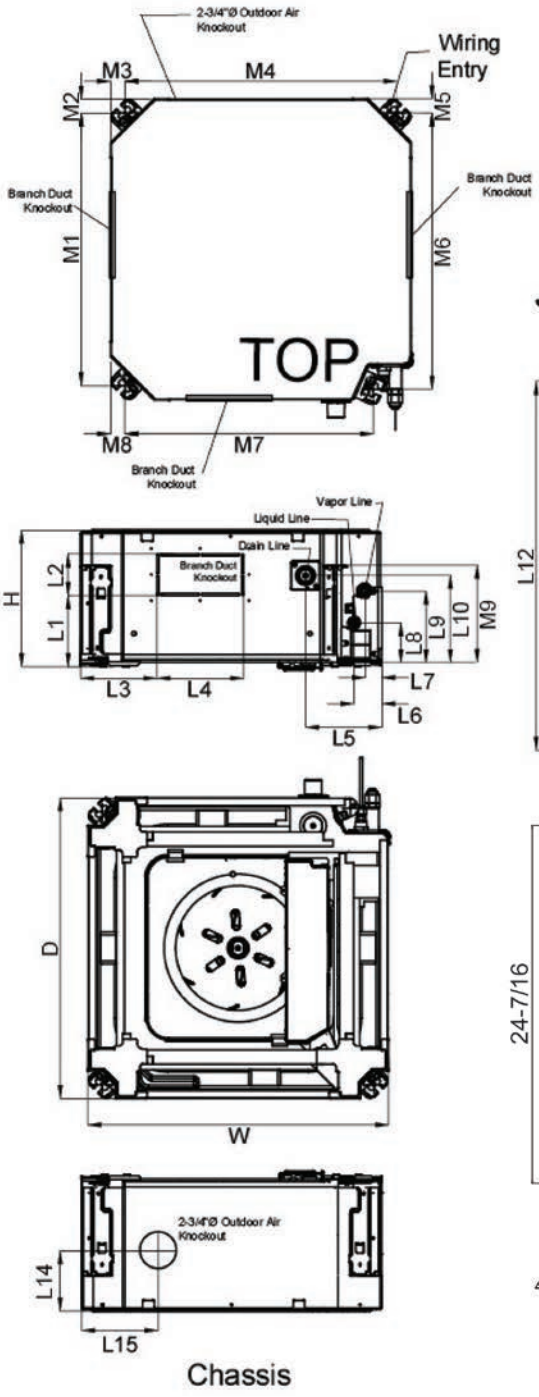
- MCA = Minimum circuit ampacity; MOP = Maximum overcurrent protection
- Units must be connected to an electrical power system that supplies voltage within the listed range limits
- Select wire size based on the larger MCA value
- Use circuit breakers instead of fuses

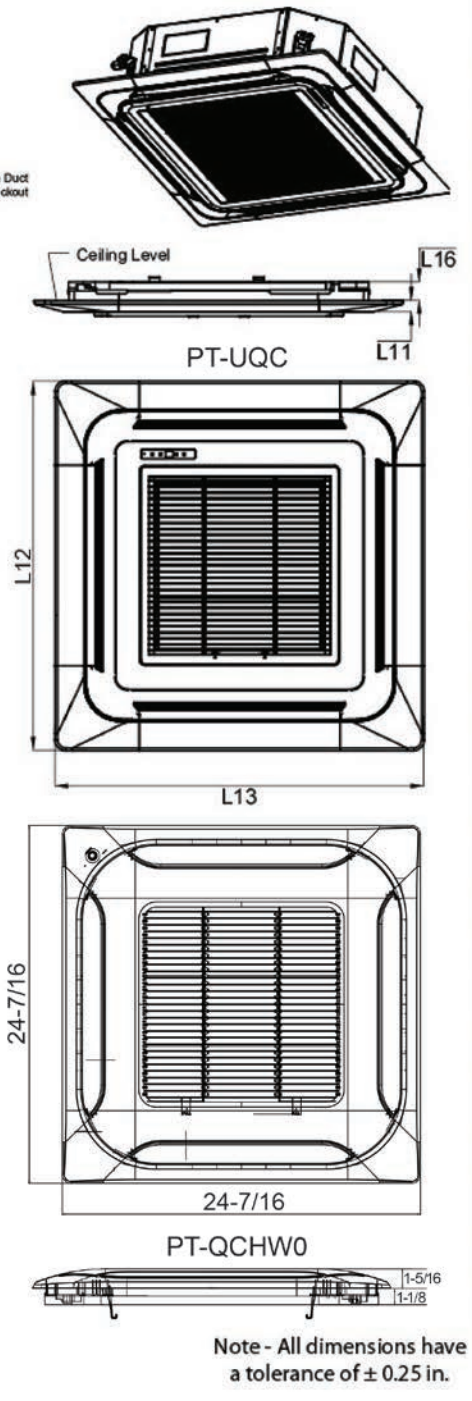
GENERAL DATA

Dimensions – TR Chassis



W	22-7/16"
H	8-7/16"
D	22-7/16"
L1	2-1/8"
L2	3-1/8"
L3	5-13/16"
L4	6-1/2"
L5	5-5/8"
L6	1-15/16"
L7	1-3/16"
L8	2-3/4"
L9	5-1/8"
L10	6-5/16"
L11	7/8"
L12	27-9/16
L13	27-9/16"
L14	3-7/16"
L15	5-7/8"
L16	1-3/16"
M1	20-3/8"
M2	1-1/16"
M3	1-1/16"
M4	20-3/8"
M5	1-1/16"
M6	20-5/8"
M7	18-3/16"
M8	1-1/16"
M9	6-15/16

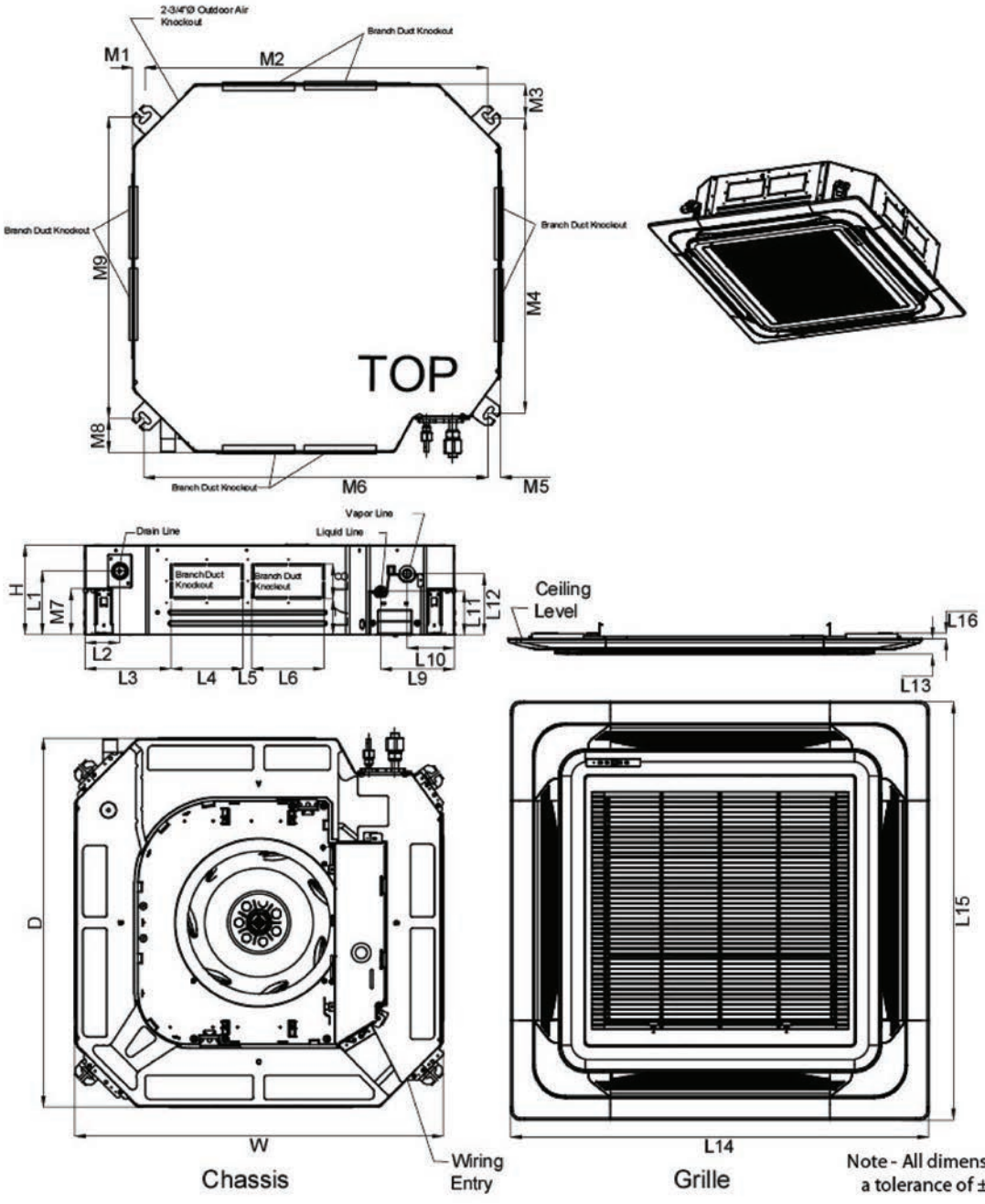




W	22-7/16"
H	10"
D	22-7/16"
L1	5"
L2	3-1/8"
L3	5-13/16"
L4	6-1/2"
L5	5-5/8"
L6	1-15/16"
L7	1-3/16"
L8	2-11/16"
L9	5-1/16"
L10	6-1/4"
L11	7/8"
L12	27-9/16
L13	27-9/16"
L14	3-1/8"
L15	5-5/8"
L16	1-3/16"
M1	20-3/8"
M2	1-1/16"
M3	1-1/16"
M4	20-3/8"
M5	1-1/16"
M6	20-5/8"
M7	18-3/16"
M8	1-1/16"
M9	6-5/16"

GENERAL DATA

Dimensions – TP Chassis

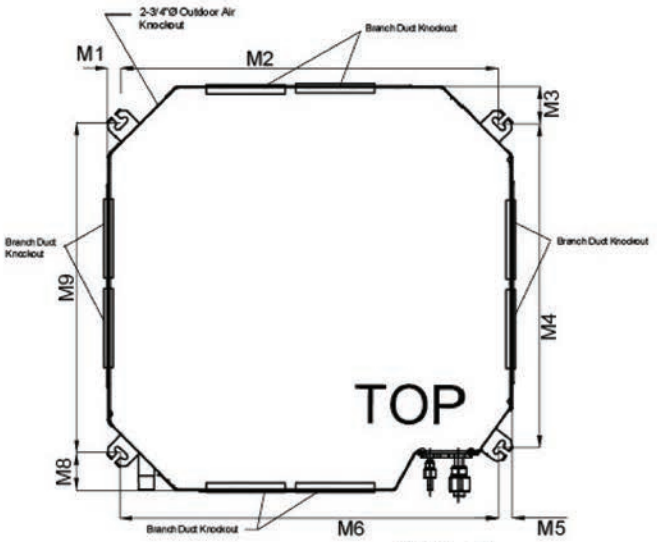


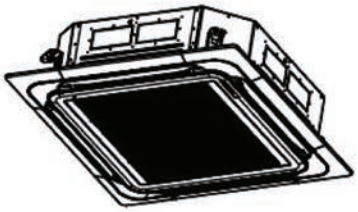
W	33-1/16"
H	8"
D	33-1/16"
L1	5-11/16
L2	3-1/8"
L3	7-11/16"
L4	6-1/2"
L5	3/4"
L6	6-1/2"
L7	3-1/4"
L8	3-1/8"
L9	6-1/2"
L10	4-3/16"
L11	3-15/16"
L12	5-7/16"
L13	1-7/16"
L14	37-3/8"
L15	37-3/8"
L16	1/2"
M1	1-1/16"
M2	30-15/16"
M3	3-1/16"
M4	26-7/16"
M5	1-1/16"
M6	30-15/16"
M7	4-1/8"
M8	3-1/16"
M9	26-15/16"

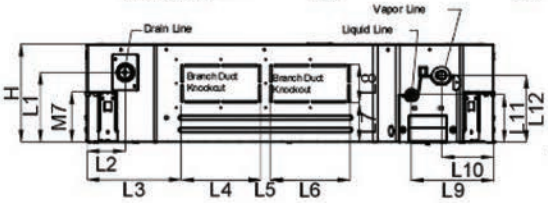
Note - All dimensions have a tolerance of ± 0.25 in.

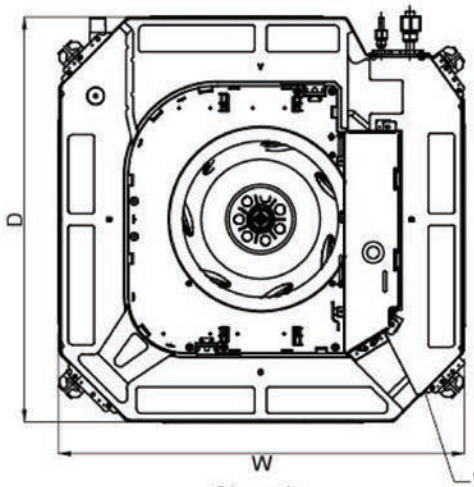
GENERAL DATA

Dimensions – TN Chassis

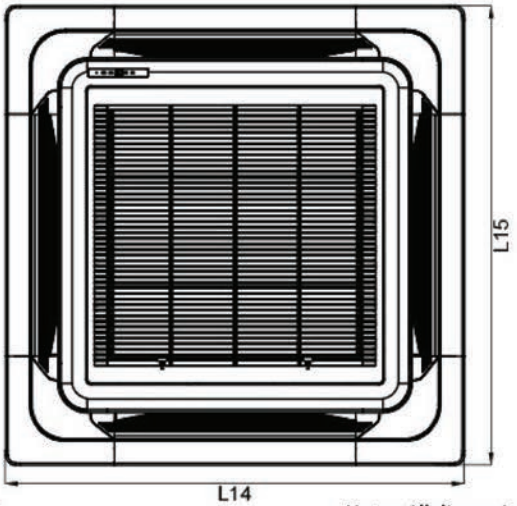








Chassis



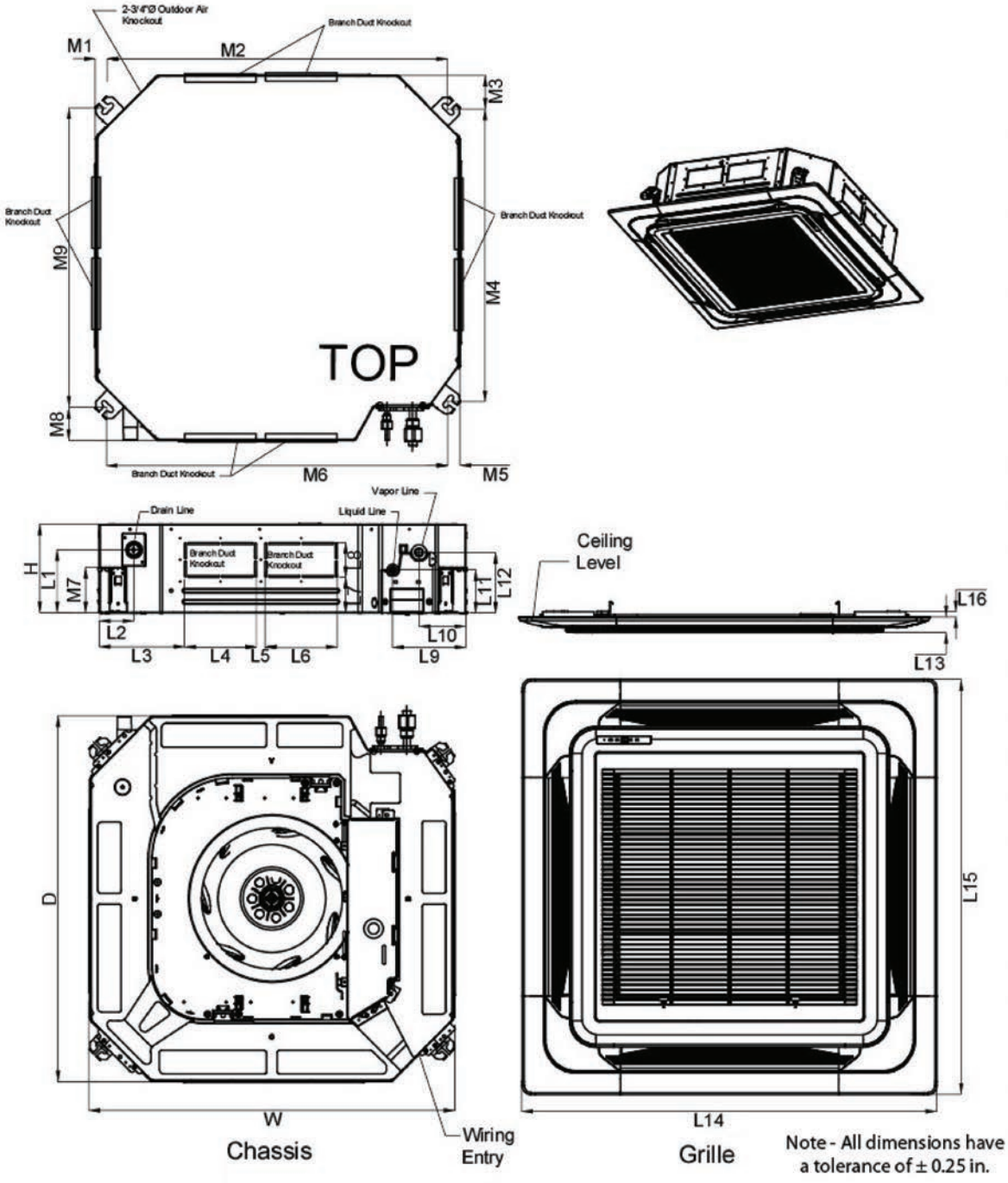
Grille

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

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

GENERAL DATA

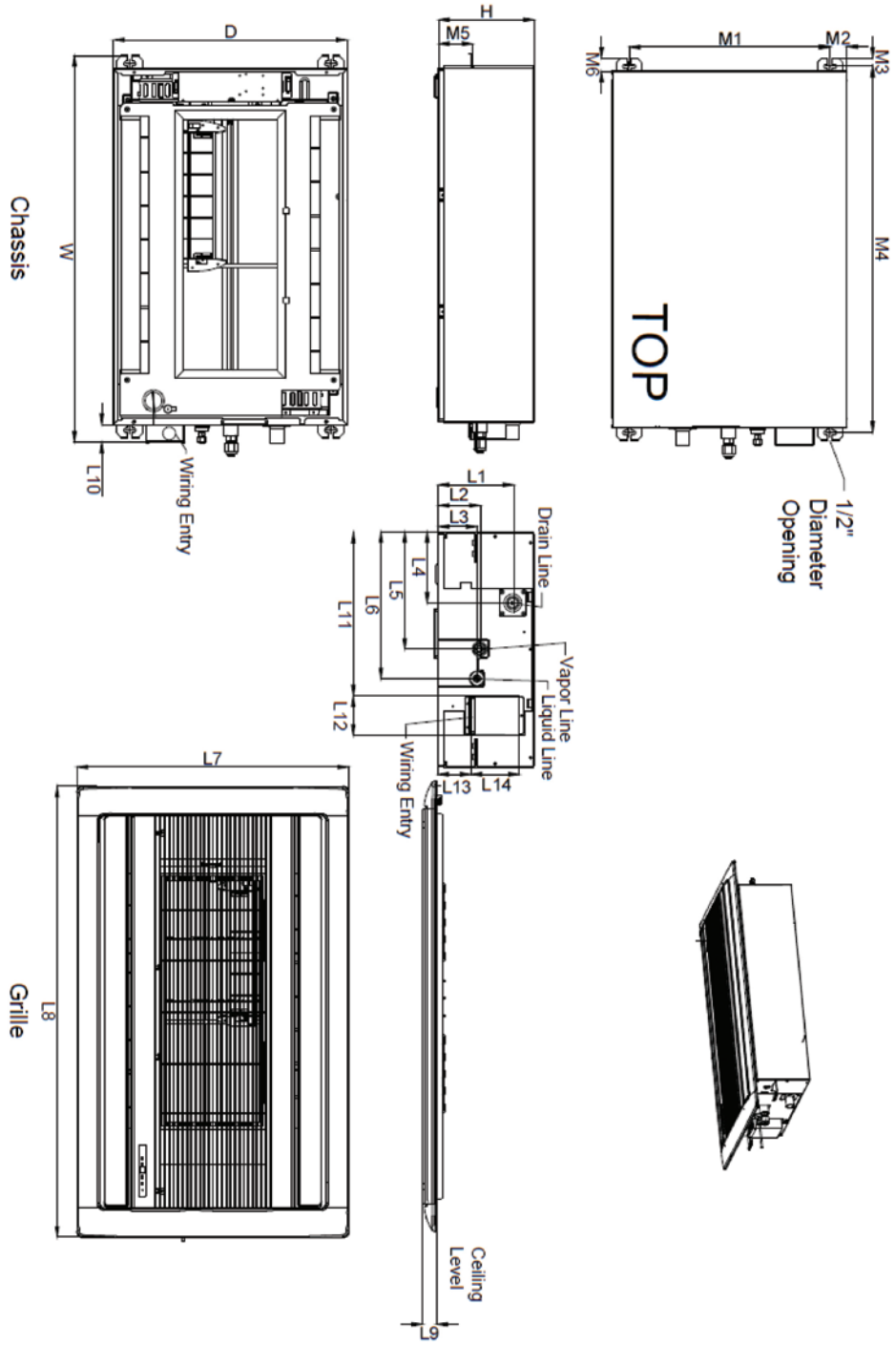
Dimensions – TM Chassis



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"

GENERAL DATA

Dimensions – TL Chassis

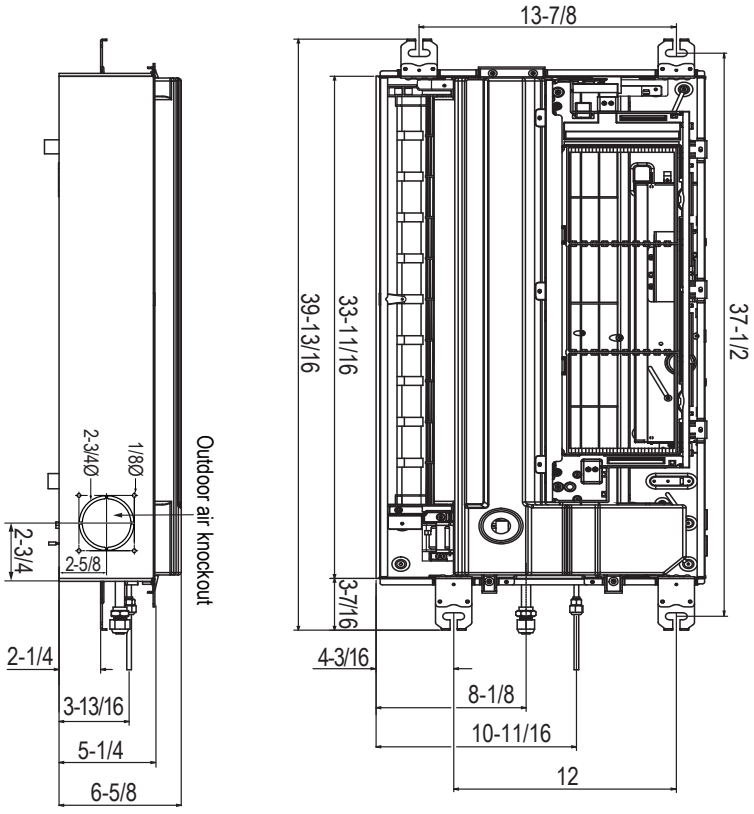


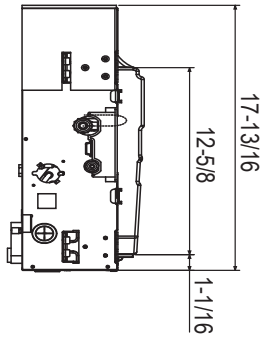
W	35-7/16"
H	8-7/8"
D	21-5/8"
L1	6-15/16"
L2	3-7/8"
L3	3-5/8"
L4	6-1/2"
L5	10-13/16"
L6	13-9/16"
L7	25-3-16"
L8	41-5/16"
L9	1-1/8"
L10	1-5/8"
L11	15"
L12	3-5/8"
L13	3-1/8"
L14	4-1/2"
M1	21-11/16"
M2	1-5/16"
M3	15-16"
M4	32-11/16"
M5	3-1/8"
M6	1-3/16"

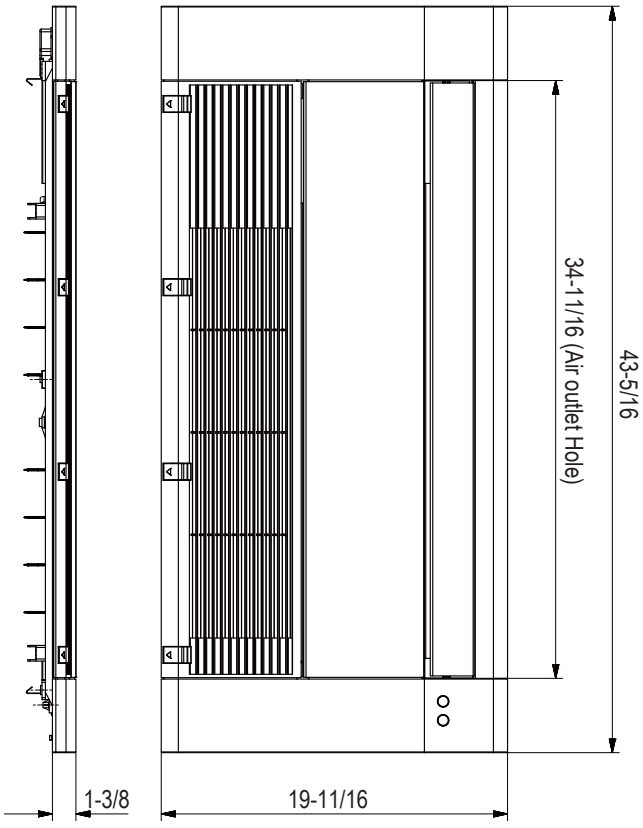
Note - All dimensions have a tolerance of ± 0.25 in.

GENERAL DATA

Dimensions – TU Chassis





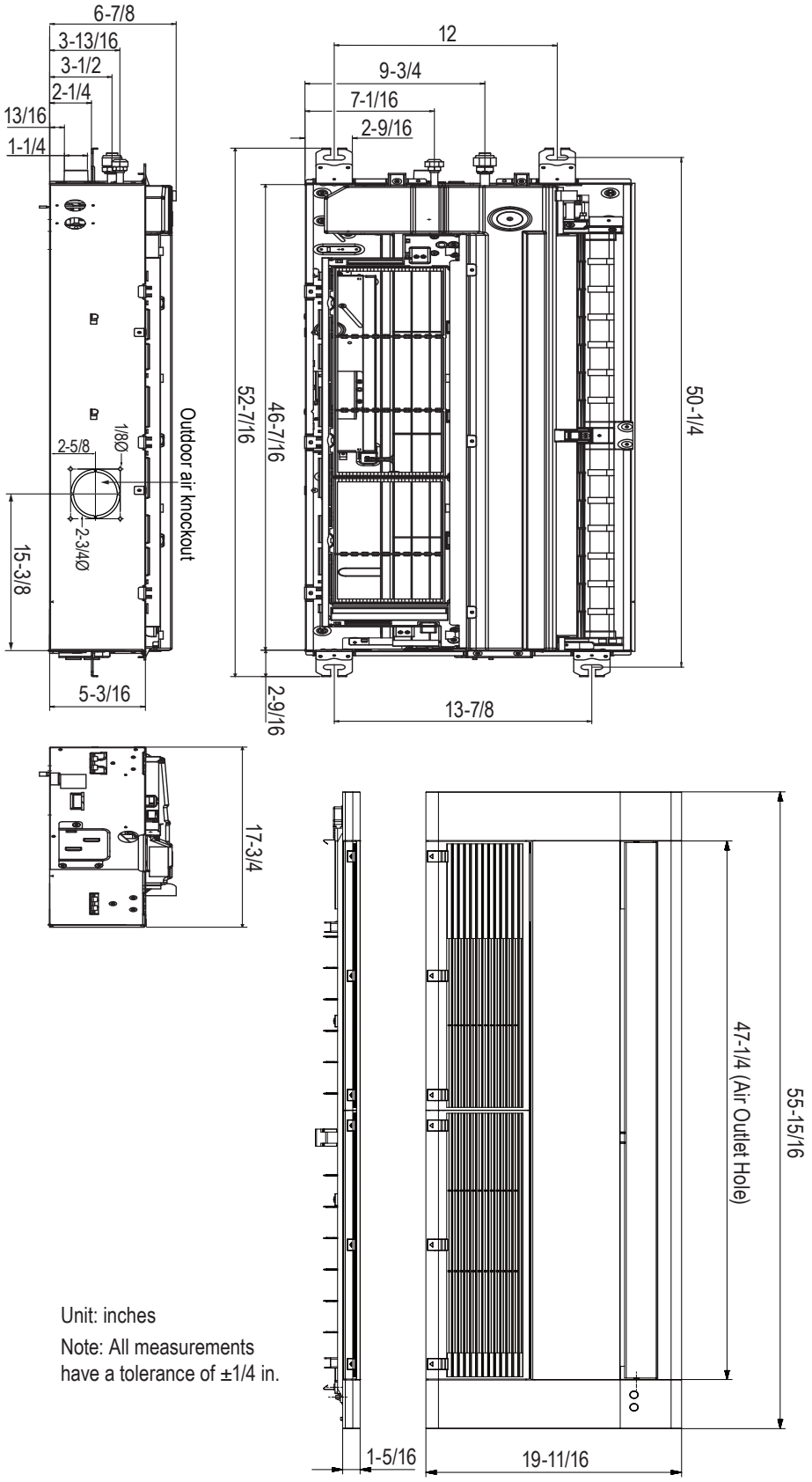


Unit: inches

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

GENERAL DATA

Dimensions – TT Chassis



Unit: inches

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

Figure 4: Refrigerant Piping Diagram TR, TQ, TP, TN, and TM Chassis

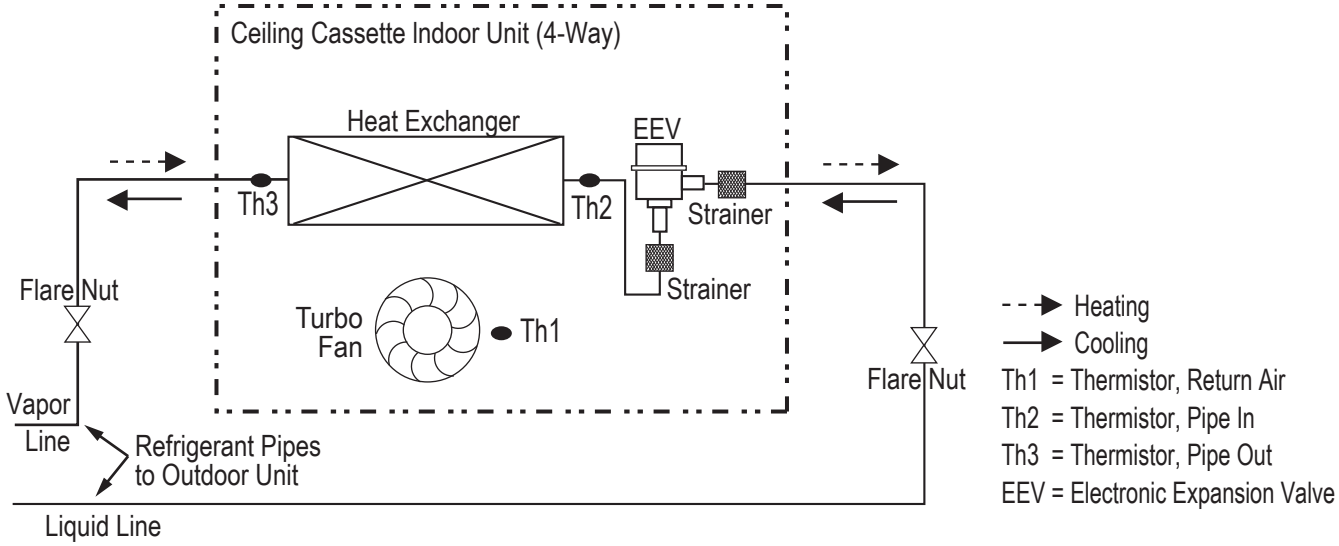
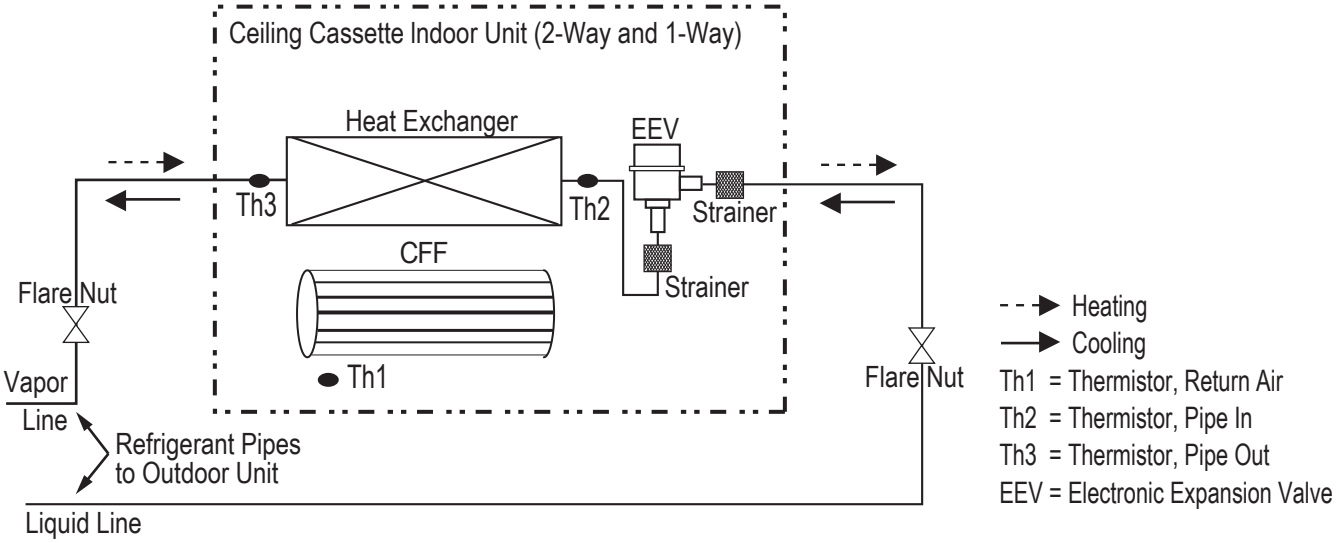


Figure 5: Refrigerant Piping Diagram TL, TT, and TU Chassis



LG

Location Selection

⚠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:

- Where there is enough structural strength to bear the weight of the unit.
- Operating sound from the unit will not disturb occupants.
- Include enough space for service access.
- Include space for drainage to ensure condensate flows properly out of the unit when it is in cooling mode.
- Use a level indicator to ensure the unit is installed on a level plane.
- Use the provided pattern to determine the size of the ceiling opening and the hanging bolt locations required by the unit.

⃠ Do not install the unit where it will be subjected to direct thermal radiation from other heat sources.

⃠ Do not install the unit in an area where combustible gas may generate, flow, stagnate, or leak. There is the possibility of fire.

⃠ 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 additional ventilation products on the chassis of the unit.

⃠ Do not install the unit near high-frequency generator sources.

⃠ Do not install the unit near a heat or steam source (Figure 6), 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 malfuction of the condensate drain. If this is a potential problem, install a ventillation fan large enough to vent out these materials.

Note:

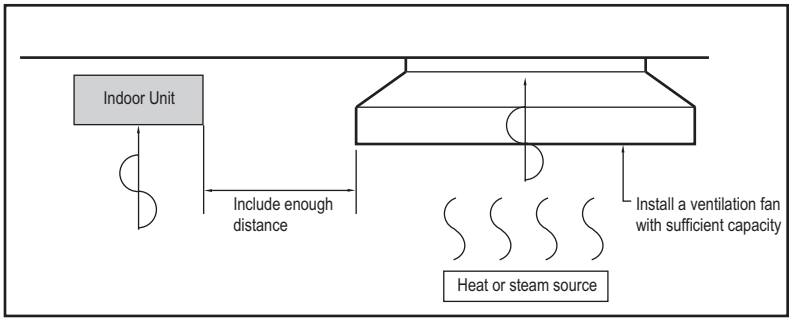
The unit may be damaged, may malfunctioin, and/or will not operate as designed if installed in any of these conditions.

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 ype of heating system to the floor.

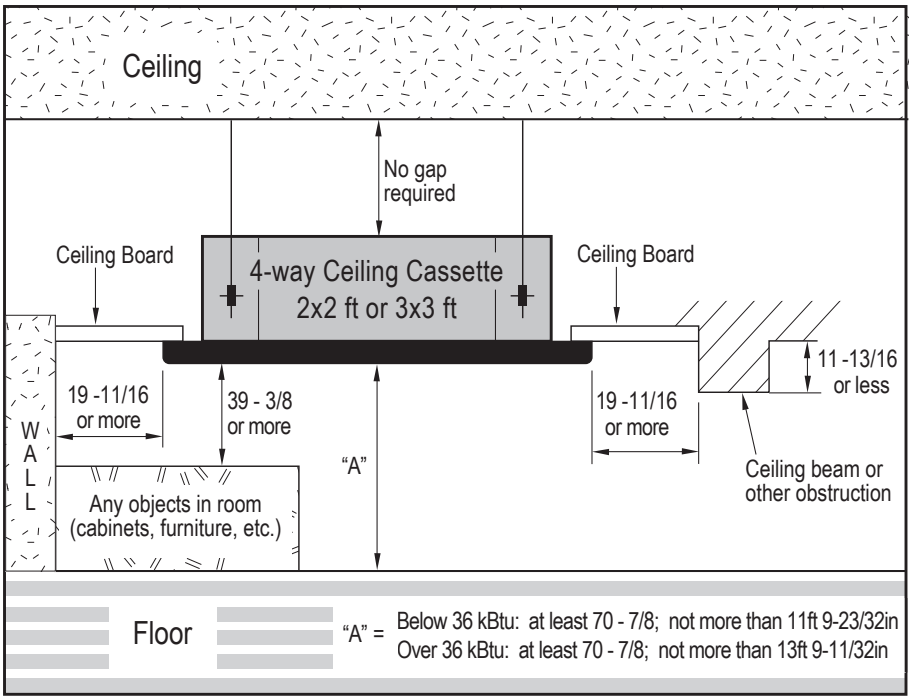
Figure 6: Installing Near a Heat or Steam Source



Required Clearances

Figure 7 shows required clearance distances around a typical installed ceiling cassette unit.

Figure 7: Required Clearances Around Installed Unit



Unit: inch

Unpack and Inspect for Freight Damage

⚠CAUTION

Shipping and net weights of the ceiling cassette units are listed in Table 2. To help avoid injury to personnel and damage to the unit, use at least two people when carrying a unit by hand.

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

After opening, if the unit is damaged, repack the unit as it was shipped to you. RETAIN ALL PACKING MATERIALS. In general, freight damage claims will be denied if the original packing materials are not retained for the claims adjustor to inspect. Call your supervisor on how to proceed with filing a freight claim and to order a replacement unit.

Note:

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 Nomenclature chart on "Cassette Indoor Units Nomenclature" on page 11.

1. Before opening the shipping container, verify you have the correct unit 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 chassis frame only. If damage is found, repack the unit as it was received in the original container.
11. If the unit is undamaged, remove and retain the installation manual. It is located under or on top of the unit.

INSTALLATION

Install Cassette Chassis

⚠WARNING

- *Chassis threaded rod hangars (bolts) and hardware must be securely installed to prevent the chassis falling from its installation location. There is risk of personnel injury or property damage 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 injury to personnel or from incorrect installation.*

Note:

- *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 chassis is installed on a level plane.*
- *Use the provided pattern to determine the size of the ceiling opening and the threaded rod hangar locations required by the unit.*

1. Determine the installation location. Use the applicable chassis ceiling pattern and open the chassis installation space (Figure 8).
2. Use the applicable chassis threaded rod hangar pattern (Figure 9 through Figure 12) to mark the four hangar locations.
3. Securely install the four field-provided threaded rod hangars.
4. Refer to Figure 13 and hang the cassette chassis from the four field-supplied hangars.
5. Use a level to ensure the chassis is level (Figure 14). All ceiling cassettes use a condensation drain pump, and the chassis must be level.
6. If local code requires an auxiliary drain pan under the unit, install a field-provided auxiliary drain pan.

Figure 8: Ceiling Opening and Threaded Rod Hangar Locations

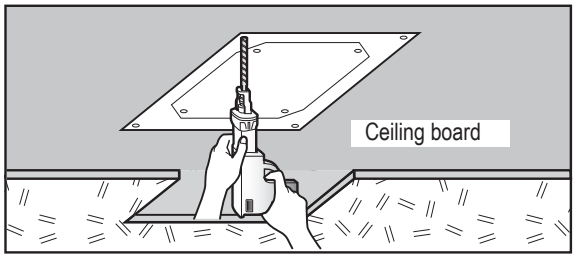


Figure 9: TP/TN/TM Chassis

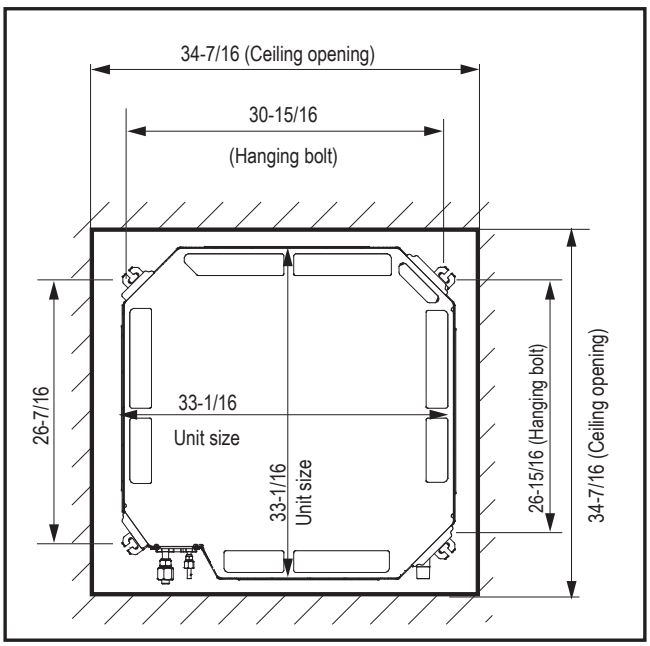


Figure 10: TQ/TR Chassis

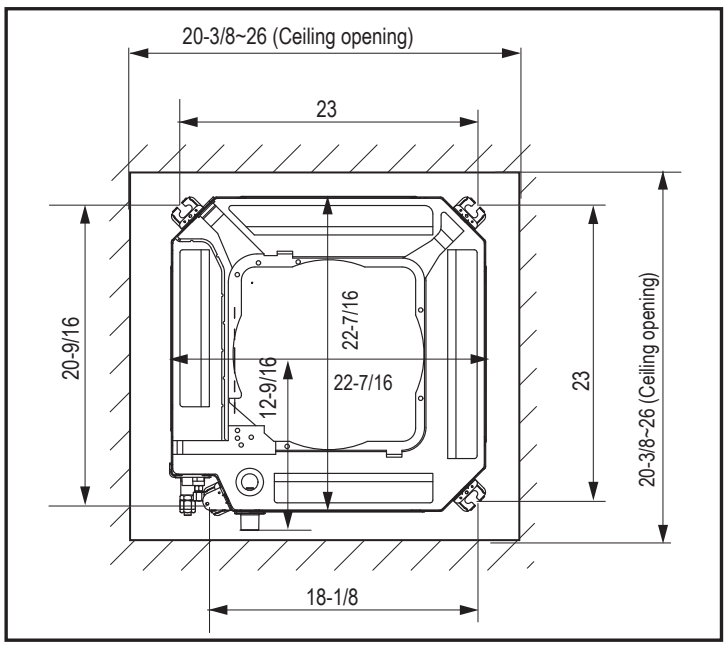


Figure 11: TL Chassis

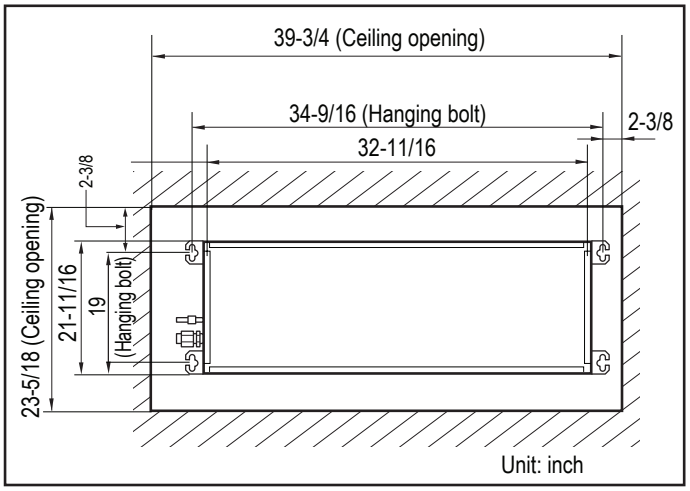


Figure 12: TU/TT Chassis

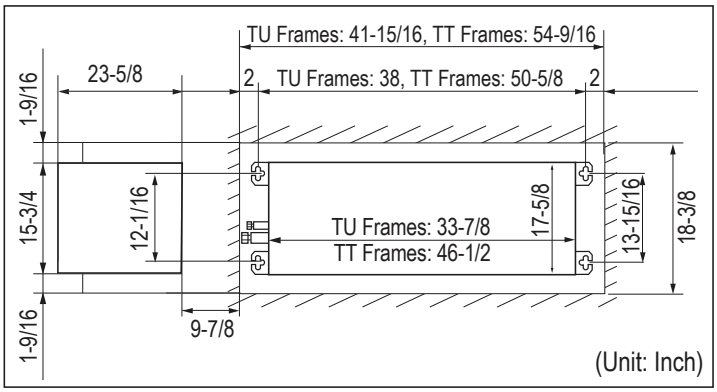


Figure 13: Typical Chassis Installation

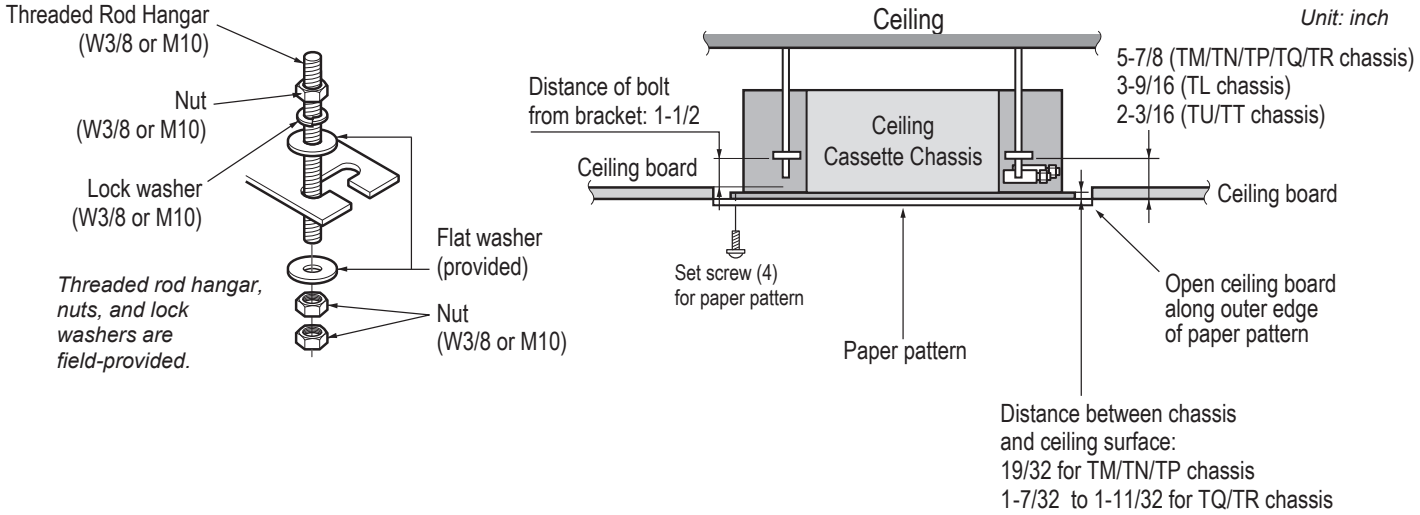
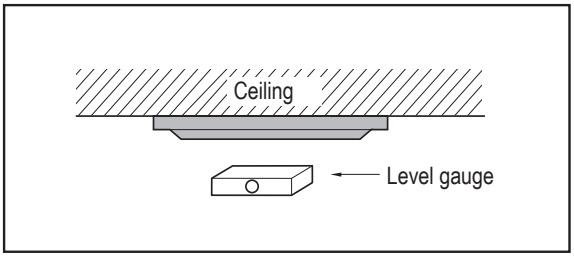


Figure 14: Level Chassis



Piping Preparation

⚠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 refrigerant combusts, it generates a toxic gas.*

Note:

• ⃠ *Do not use kinked pipe.*

Braze the pipe to the service valve pipe stub of the outdoor unit. After brazing, check for refrigerant gas leaks. When selecting flare fittings, always use a 45° fitting rated for high-pressure refrigerant R410A. Fittings must also comply with local, state, and federal standards.

Creating a Flare Fitting

One of the main causes of refrigerant leaks is defective flared connections. Use the following procedure to create flared connections.

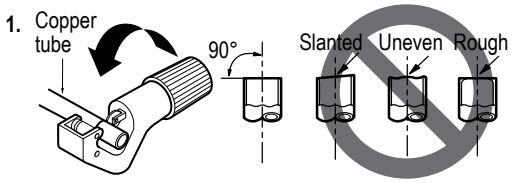
1. Determine the installation location. Ensure the location has enough space to allow necessary duct connections and maintenance access.
   - Measure the distance between the indoor unit and the outdoor unit.
   - Cut the pipes a little longer than measured distance.

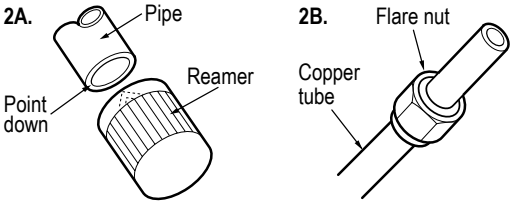
2A. Remove the burrs.

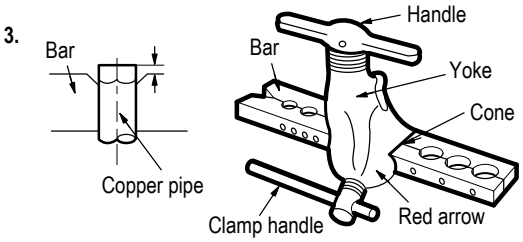
- Completely remove all burrs from pipe ends.
- When removing burrs, point the end of the copper pipe down to avoid introducing foreign materials into the pipe.

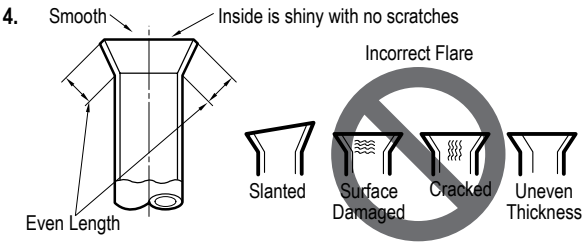
2B. Slide the flare nut onto the copper tube.

3. Flare 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.

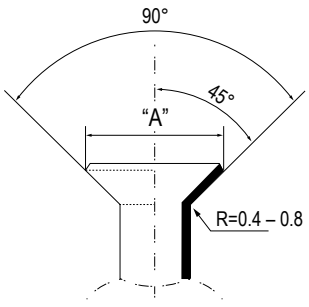








Dimensions of the Flare.



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

Tightening Flare Nuts

Tightening torque for flare nuts:

Pipe Size (in. OD)	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 (inside and outside) with polyvinyl ether (PVE) refrigeration oil only.

Note:

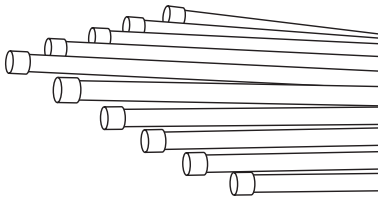
- ⃠ *Do not use polyolyester (POE) or any other type of mineral oil as a lubricant. These lubricants are not compatible with PVE oil used in this system and create oil sludge leading to equipment damage and system malfunction.*

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 Flare Nuts

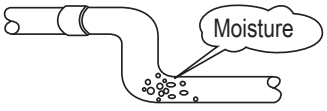
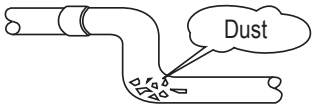
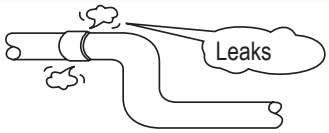
Always use two (2) wrenches to loosen flare nuts.

Keep Pipes Capped While Storing.



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 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	- Significant hydrolysis of refrigerant oil. - Refrigerant oil degradation. - Poor insulation of the compressor. - System does not operate properly. - EEVs, capillary tubes are clogged.	- Refrigerant oil degradation. - Poor insulation of the compressor. - System does not operate properly. - EEVs and capillary tubes become clogged.	- Refrigerant gas leaks/shortages. - Refrigerant oil degradation. - Poor insulation of the compressor. - System does not operate properly.
Solutions	- 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 minimum of 500 microns and insure the vacuum holds at that level for 24 hours	- 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.	- 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.

Refrigerant Safety

⚠WARNING

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

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

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

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

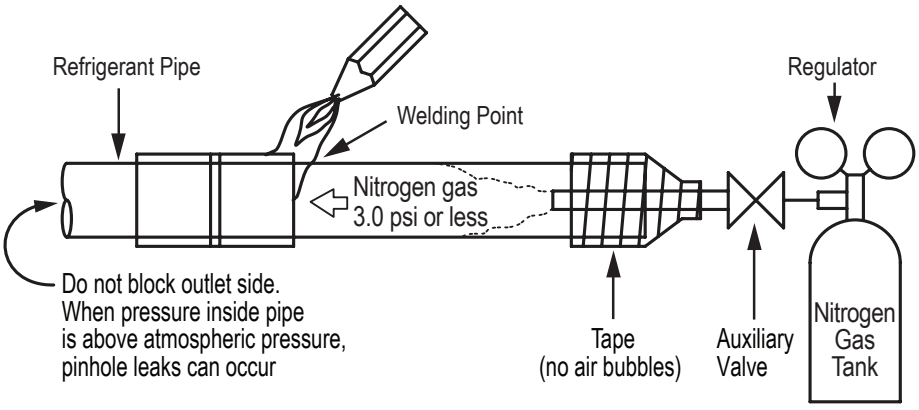
Brazing

Note:

It is imperative to keep the piping system free of contaminants and debris such as copper burrs, slag, or carbon dust during installation.

1. All joints are brazed in the field. Multi V IV 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.
   - Store pipe stock in a dry place and keep stored pipe capped and clean.
   - Purge all pipe sections clean with dry nitrogen prior to assembly.
2. Proper system operation depends on the installer using best practices and the utmost care while assembling the piping system.
   - Use adapters to assemble different sizes of pipe.
   - 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.
   - Use a tubing cutter; do not use a saw to cut pipe. De-bur and clean all cuts before assembly.
3. 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 excessibe heat with a wet rag or heat barrier spray.

Figure 15: Using Nitrogen Gas During Brazing



LG

A properly installed pipe system will have sufficient support so that pipes will not sag during the life of the system. As necessary, place supports closer for segments where potential sagging could occur. Maximum spacing of pipe supports must meet local codes.

Figure 16: Pipe Support at Indoor Unit.

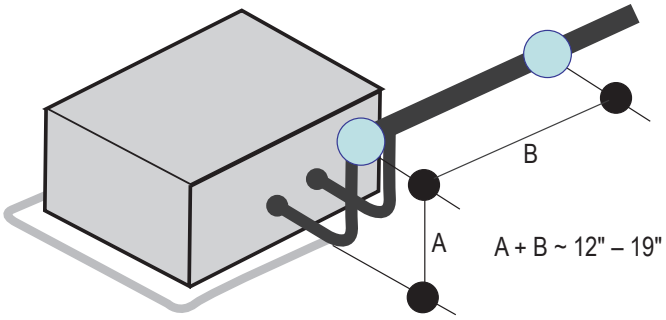
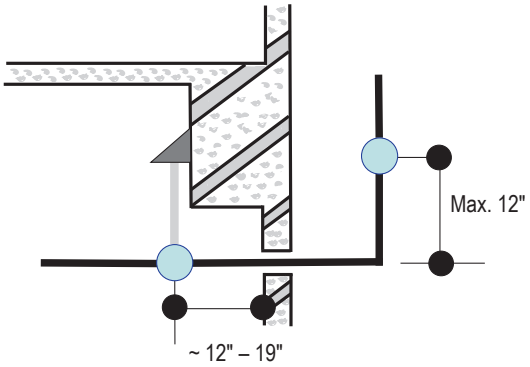


Figure 17: Typical Pipe Support Location—Change in Pipe Direction.



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.

Brazed Connections

Note:

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.

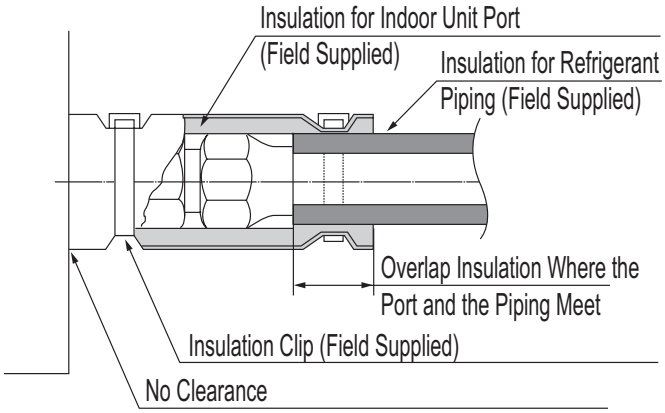
Insulate Refrigerant Pipes

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

Wrap all refrigerant and condensate 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.

Figure 18: Typical Refrigerant Line Flare Fitting Insulation Detail



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.

Table 4: Indoor Unit Drainage Specifications.

Indoor Unit	Drain Type	Drain Pipe Dia. (ID, in.)
1-, 2-, and 4-way Ceiling Cassette	27 in. Lift Drain Pump, Factory Installed	Ø1

Note:

When making condensate pipe connections, be careful not to exert lateral force on the drain nipple. Internal damage may occur. Refer to Table 15 for condensate pipe connection sizes.

Condensate Pump Connection

All cassette units have a condensate pump. 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 in.-wg.
- Measure lift distance from the bottom surface of the indoor unit, NOT from the condensate pipe connection.
- Slope all horizontal condensate pipe segments a minimum of 1/4 inch per foot away from the indoor unit.

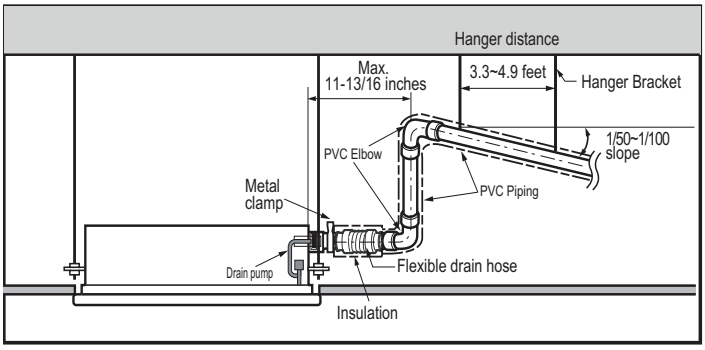
Cassette Unit Drain Information

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 horizontal, connect the inverted trap to the top half of the pipe. The connection point of the inverted trap to the building drain pipe should always be to the top half of the pipe and should 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.

Figure 19: Ceiling Cassette Indoor Unit Drain Pump to Drain Piping System



No Gravity Condensate Pipe Connection

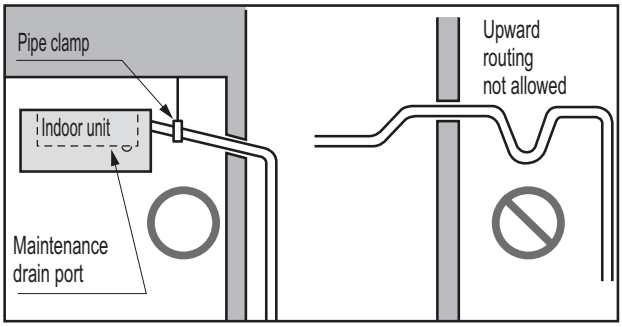
Ceiling cassette indoor units do not have a gravity condensate pipe connection. There is a service drain plug on the bottom of each unit under the decorative panel. This drain plug is intended as a service feature and is not to be used as a permanent gravity drain connection.

Install the Condensation Drain Pipe

- Drain piping must slope down or flow may reverse back to unit.
- During drain piping connection, be careful not to exert extra force on the drain port on the indoor unit.
- Refer to Table 15 for drain pipe sizing.
- Use polyvinyl chloride pipe.
- Install insulation on the drain piping.
- Use polyethylene foam greater than 5/16 inch thick for insulation.

1. Refer to Figure 20 and plan the drain pipe routing so that the pipe will slope downward from the indoor unit to its end drain location.

Figure 20: Drain Piping Slope.



2. Connect the provided flexible drain pipe to the main drain pipe.
3. Pour water into the flexible pipe as shown in Figure 23 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 thermal insulation on the flexible drain pipe and position snugly against indoor unit.

Figure 22: Do Not Sharply Bend Drain Pipe.

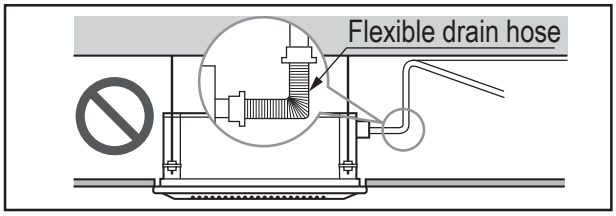


Figure 21: Properly Insulating the Drainage Piping.

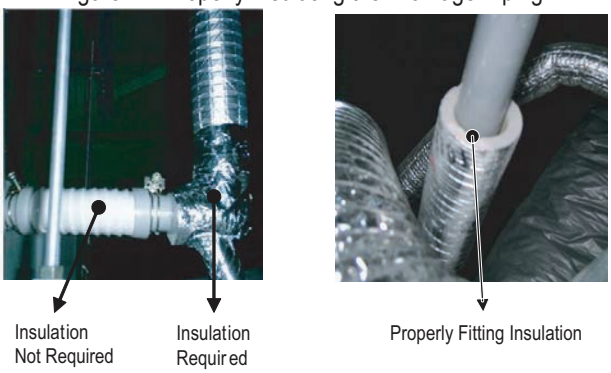
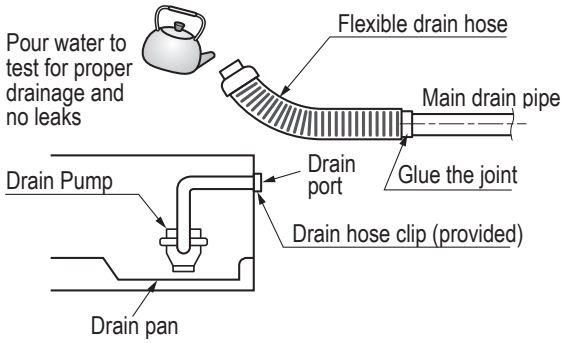


Figure 23: Testing the Drain Pipe.



Connecting Power and Control Wiring

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.

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

Properly size all circuit breakers or fuses.
There is risk of fire, electric shock, explosion, physical injury or death.

⚠ WARNING

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 personal injury or death.

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 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:

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.

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 and will void the LG limited liability warranty.

Note:

Failure to follow any of these power and communications wiring guidelines or instructions will likely cause communications errors and unit malfunction.

Polarity matters. When connecting the communications cable conductors at each Multi V system component, be careful the conductor connected to the IDU(A) terminal on the outdoor unit is connected to the A/3(A) terminal at each indoor unit. The conductor connected to the IDU(B) terminal on the outdoor unit must be connected to the B/4(B) terminals at each indoor unit. Cross connecting the A/3(A) and B/4(B) terminals will cause communications errors and system malfunction.

Note:

The minimum distance required between power wires and the communications cable is voltage/amperage dependent and in cases where either are relatively high the minimum distance may be more than two (2) inches. Refer to the appropriate LG Multi V Outdoor Unit Engineering Manual on www.lg-vrf.com for detailed information.

- Keep communications cables away from line voltage wiring, lighting ballasts, and other devices emitting EMF energy. Maintain a minimum of two (2) inches between line voltage wires and communications or zone controller cables.
- Field provide a minimum of 18-2 AWG, stranded and shielded, PVC or vinyl jacket communications wiring between the indoor units, heat recovery boxes (if applicable), and outdoor units.
- The outdoor/indoor unit communications cable must be run between components in a daisy chain configuration. Star or wye configurations are not allowed.
- Refer to the wiring connection diagrams for the appropriate unit (Figure 32 through Figure 38) Connect the communications cables to the A/3(A) and B/4(B) terminals at indoor units and/or heat recovery units. Maintain polarity throughout the communications bus. Be sure A/3(A) terminals are connected to A/3(A) terminals and B/4(B) terminals are connected to B/4(B) terminals.
- Ground the shield of the communications cable at one end only, at the master outdoor unit.

Don'ts

- Never use wire caps and never splice communications cables.
- Star and Wye communications cable configurations are not acceptable.
- Never connect zone controllers or other central control products such as AC Smart, PDI, or LG building management system gateway products to the IDU/ODU communications cable.

Communication and Power Cables Connection

Note:

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 may use discretion when choosing the order the components are connected to the communications bus, but must maintain the daisy chain and polarity configuration.

1. If not already done so, read Connecting Power and Control Wiring on the previous page.
2. Remove a knock-out plug 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. Provide at least three (3) to four (4) inches of slack cable at each indoor unit.
6. Strip approximately half of an inch of insulation from each communications cable conductor.
7. Proceed to the appropriate IDU wiring procedure for 4-way, 2-way, or 1-way cassette.

⚠ 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.

Cable Connections

1. Ensure the input power is disconnected and there is no power on the power input cable.
2. Refer to Figure 24 and route the power and outdoor unit communications cables into the chassis through two different knockouts. Do not route the communications cable near the power cable.
3. Secure the power cable to the 1(L1) and 2(L2) terminal block connections as shown in Figure 25.
4. Connect the field-provided IDU to ODU communications cable as shown in Figure 25. This cable must be 18-2, stranded, shielded, and meet all applicable codes. Polarity matters on this IDU to ODU communications bus. Be sure to connect A terminals to A terminals and B terminals to B terminals. Ensure the communication cable is properly grounded at the master outdoor unit only. Do not ground this IDU to ODU communications cable at any other point.
5. Connect the cable from the remote (wall) controller to the unit's remote control connection. On some units this cable connects to a pigtail cable from the CN-REMO connector on the control board and on some units it connects directly to the CN-REMO connector.
6. Refer to the cable connection diagram in Figure 26 and connect any additional cables required for your installation.

Figure 24: Typical 4-Way Cassette Cable Routing

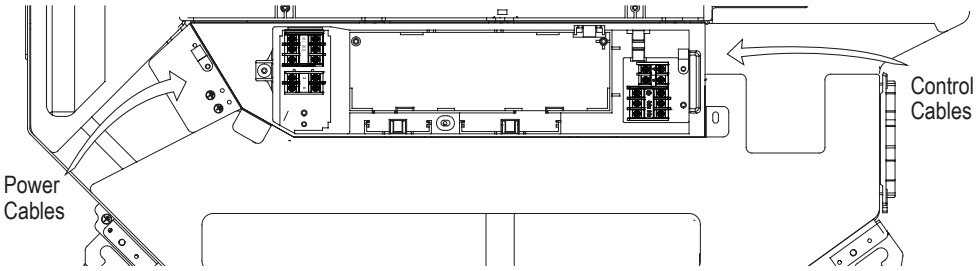


Figure 25: Typical 4-Way Cassette Cable Connections

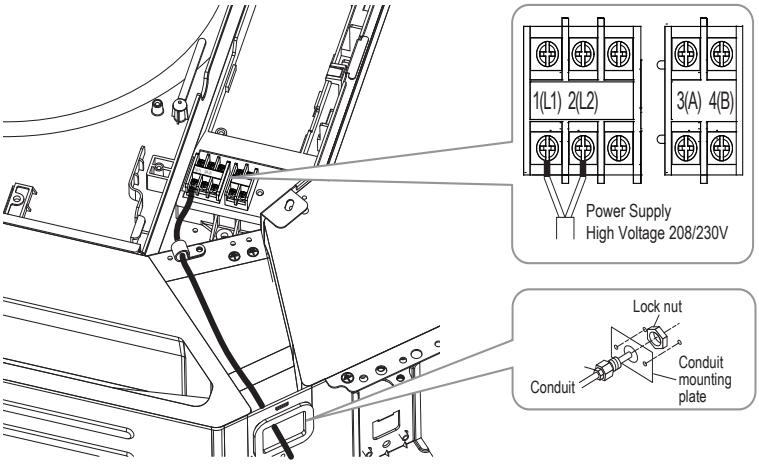
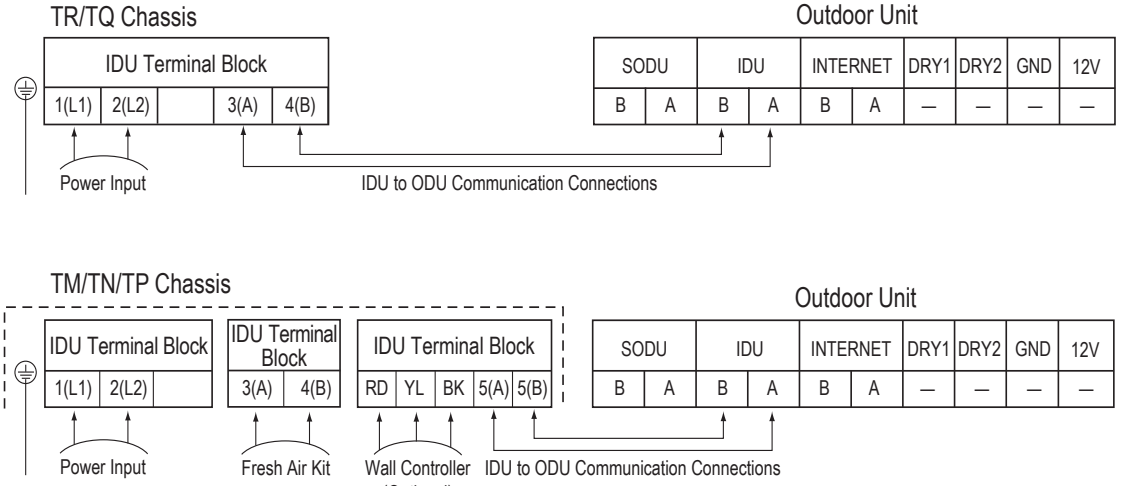
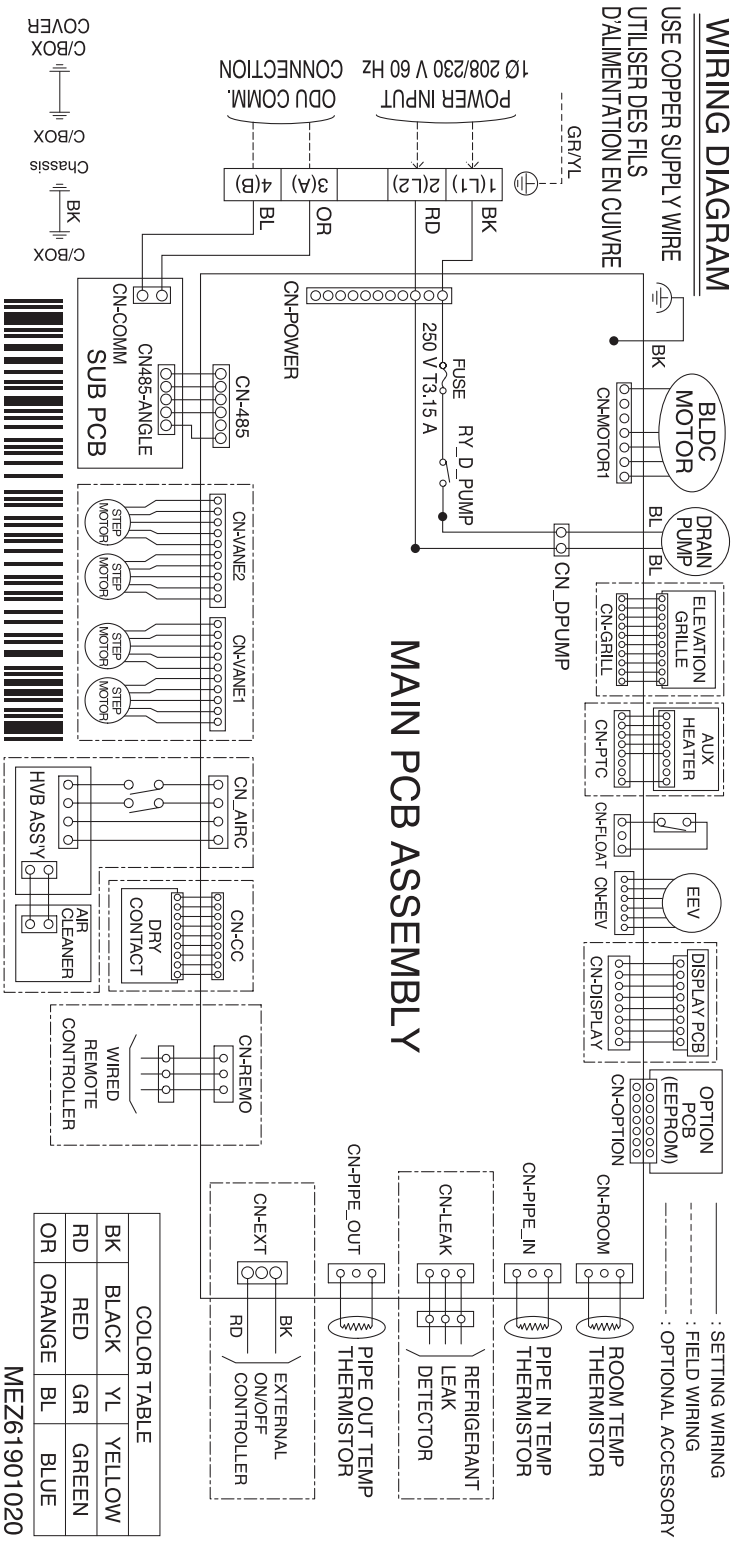


Figure 26: 4-Way Cassette Cable Connections



LG

Figure 27: TR, TQ Chassis Wiring Diagram



WIRING

4-Way Cassette TR, TQ Chassis

Table 5: TR, TQ Chassis Wiring Diagram

CONNECTOR	PURPOSE	FUNCTION
CN-POWER	AC Power supply	AC Power line
CN-MOTOR1	Fan motor output	Motor output of BLDC
CN-D/PUMP	Drain pump output	AC output for drain pump
CN-PTC	Auxiliary heater	Connection for Auxiliary Heater
CN-FLOAT (BL)	Float switch input	Float switch sensing
CN-EEV	EEV Output	EEV control output
CN-DISPLAY	Display	Display of indoor status
CN-OPTION	Optional PCB EPROM	Option PCB connection
CN-ROOM (YL)	Room sensor	Room air thermistor
CN-PIPE_IN (WH)	Suction pipe sensor	Pipe in thermistor
CN-PIPE_OUT (RD)	Discharge pipe sensor	Pipe out thermistor
CN-EXT	External on/off controller	External on/off controller connection
CN-REMO (GN)	Wired remote controller	Wired remote control connection
CN-CC	Dry contact	Dry Contact connection
CN-AIRC*	Air cleaner*	Air cleaner control*
CN-VANE1	Step motor	Step motor output
CN-VANE2	Step motor	Step motor output
CN-485	Communication	Connection between indoor and outdoor units

*Plasma filter kit accessories are available separately. Always follow all local, state, and national building codes with the use of this or any product.

Table 6: TR, TQ Chassis DIP Switch Settings

Switch	Function	OFF	ON	Description
3	Group Control	Master	Slave	Selects master or slave operation for the IDU
4	Dry Contact	Variable	Auto	Selects mode of operation for optional dry contact: 1. Variable: Auto or Manual mode can be set with a 7-day programmable controller or wireless remote controller (factory setting is Manual) 2. Auto: Selects Auto mode
7	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 cassette indoor units, DIP Switches 1, 2, 6 through 8 must be set to OFF. These DIP switches are used for other models.**

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

Figure 28: TPC4, TNC4, TMC4, TNA4, TMA4 Chassis Wiring Diagram

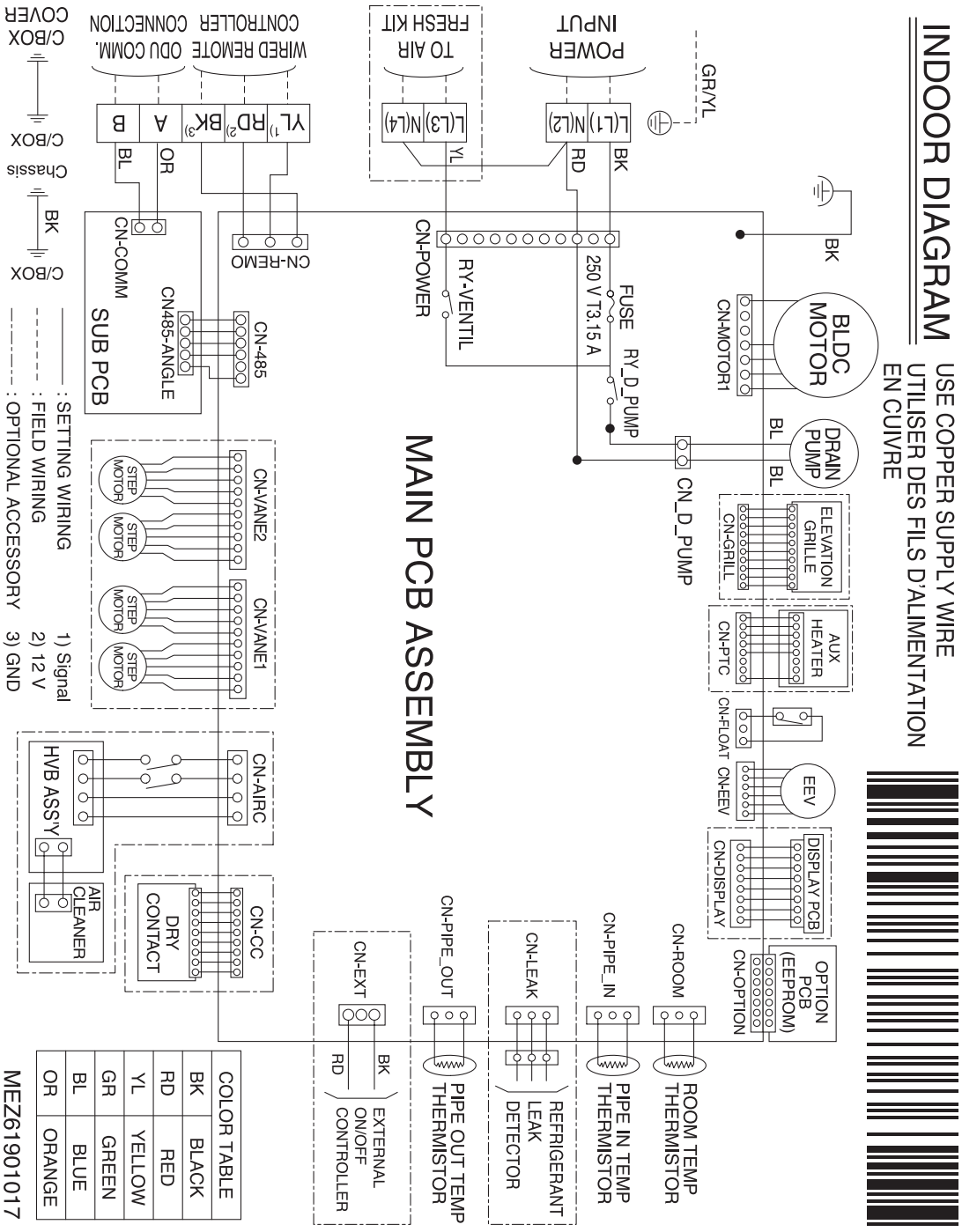


Table 7: TPC4, TNC4, TMC4, TNA4, TMA4 Chassis Wiring Diagram Connectors

CONNECTOR	PURPOSE	FUNCTION
CN-POWER	AC Power supply	AC Power line
CN-MOTOR1	Fan motor output	Motor output of BLDC
CN-D/PUMP	Drain pump output	AC output for drain pump
CN-PTC	Auxiliary heater	Connection for Auxiliary Heater
CN-FLOAT (BL)	Float switch input	Float switch sensing
CN-EEV	EEV Output	EEV control output
CN-DISPLAY	Display	Display of indoor status
CN-OPTION	Optional PCB EPROM	Option PCB connection
CN-ROOM	Room sensor	Room air thermistor
CN-PIPE_IN	Suction pipe sensor	Pipe in thermistor
CN-PIPE_OUT	Discharge pipe sensor	Pipe out thermistor
CN-EXT	External on/off controller	External on/off controller connection
CN-CC	Dry contact	Dry Contact connection
CN-HVB*	Air cleaner*	Air cleaner control*
CN-VANE1	Step motor	Step motor output
CN-VANE2	Step motor	Step motor output
CN-485	Communication	Connection between indoor and outdoor units
CN-REMO	Wired remote controller	Wired remote control connection
CN-GRILL	Elevation grille	Elevation grille connection

*Plasma filter kit accessories are available separately. Always follow all local, state, and national building codes with the use of this or any product.

Table 8: TPC4, TNC4, TMC4, TNA4, TMA4 Chassis DIP Switch Settings

Switch	Function	OFF	ON	Description
3	Group Control	Master	Slave	Selects master or slave operation for the IDU
4	Dry Contact	Variable	Auto	Selects mode of operation for optional dry contact: 1. Variable: Auto or Manual mode can be set with a 7-day programmable controller or wireless remote controller (factory setting is Manual) 2. Auto: Selects Auto mode
7	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 cassette indoor units, DIP Switches 1, 2, 6 through 8 must be set to OFF. These DIP switches are used for other models.**

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

⚠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.

Cable Connections

1. Ensure the input power is disconnected and there is no power on the power input cable.
2. Refer to Figure 29 and route the power and outdoor unit communications cables to the unit's terminal block. Do not route the communications cable near the power cable.
3. Connect the power cable to the 1(L1) and 2(L2) terminal block connections. Ensure the screws securely connect the wire to the terminals and are not loose.
4. Connect the field-provided outdoor unit communications cable to the 3(A) and 4(B) terminal block connections. This cable must be 18-2, stranded, shielded, and meet all applicable codes. Polarity matters on this IDU to ODU communications bus. Be sure to connect A terminals to A terminals and B terminals to B terminals. Ensure this communication cable is properly grounded at the master outdoor unit only. Do not ground this IDU to ODU communications cable at any other point.
5. If the unit has a wall-mounted zone controller, connect the controller's cable to the unit's remote control connection. On some units this cable connects to a pigtail cable from the CN-REMO connector on the control board and on some units it connects directly to the CN-REMO connector.

Figure 29: Typical TL Chassis Cable Connections

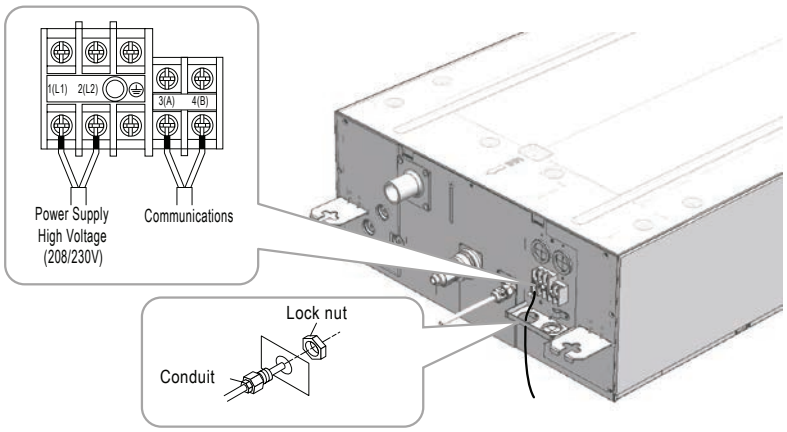


Figure 30: TL Chassis Wiring Diagram

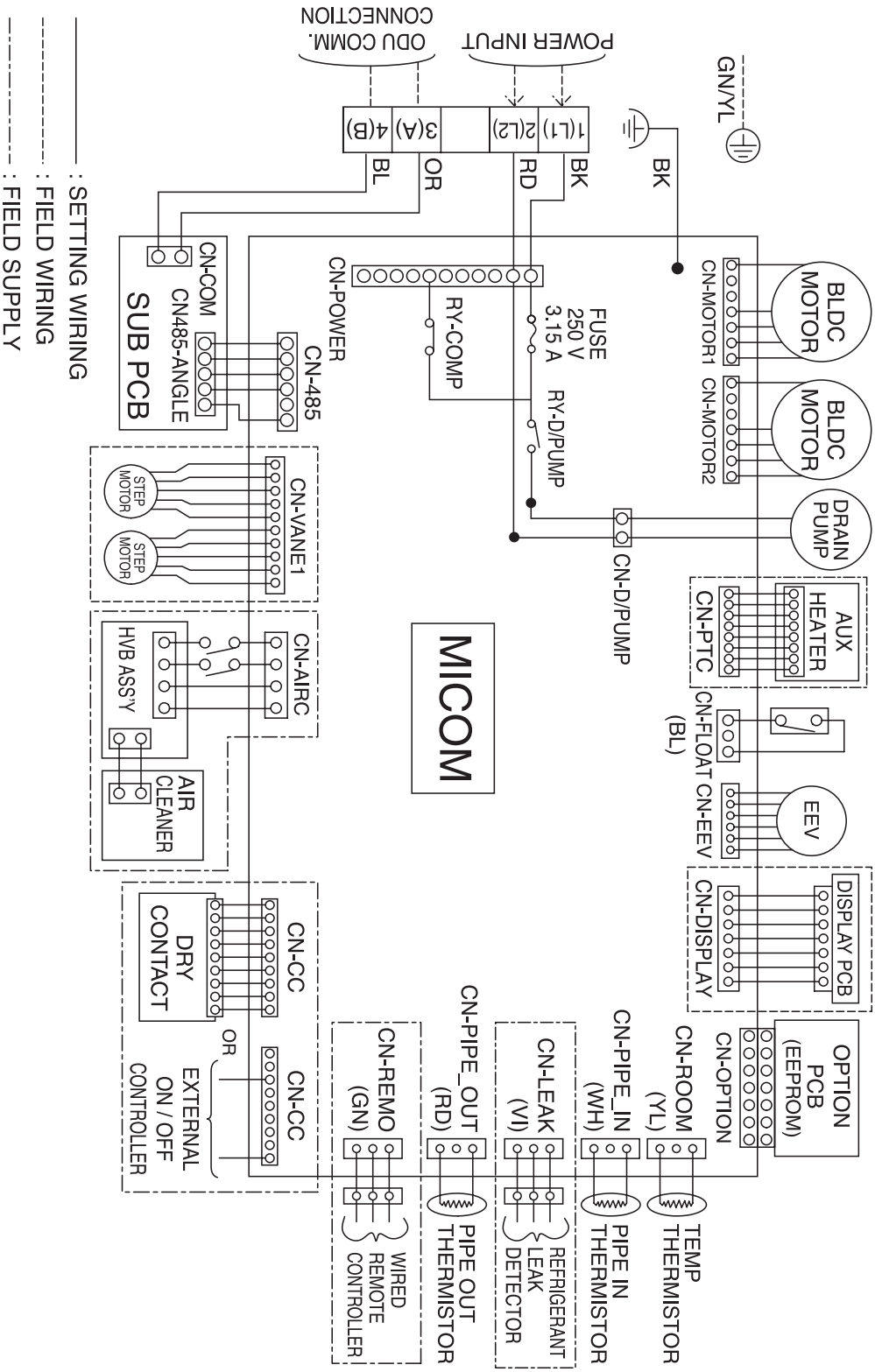


Table 9: TL Chassis Wiring Diagram Connectors

CONNECTOR	LOCATION POINT	FUNCTION
CN-POWER	AC Power supply	AC Power line input for indoor controller
CN-MOTOR1	Fan motor output	Motor output of BLDC
CN-MOTOR2	Fan motor output	Motor output of BLDC
CN-D/PUMP	Drain pump output	AC output for drain pump
CN-PTC	Auxiliary heater	Auxiliary heater connection
CN-FLOAT	Float switch input	Float switch sensing
CN-EEV	EEV Output	EEV Control output
CN-DISP	Display	Display of indoor status
CN-OPTION	Option PCB (EPROM)	Option PCB connection
CN-ROOM	Room sensor	Room air thermistor
CN-PIPE/IN	Suction pipe sensor	Pipe in thermistor
CN-PIPE/OUT	Discharge pipe sensor	Pipe out thermistor
CN-REMO	Remote controller	Remote control line
CN-CC	Dry Contact OR External on/off controller	Connection to Dry Contact OR External on/off controller connection
CN-AIRC*	Air cleaner*	Air cleaner control*
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

*Plasma filter kit accessories are available separately. Always follow all local, state, and national building codes with the use of this or any product.

Table 10: TL Chassis DIP Switch Settings

Switch	Function	OFF	ON	Description
3	Group Control	Master	Slave	Selects master or slave operation for the IDU
4	Dry Contact	Variable	Auto	Selects mode of operation for optional dry contact: 1. Variable: Auto or Manual mode can be set with a 7-day programmable controller or wireless remote controller (factory setting is Manual) 2. Auto: Selects Auto mode

***For Gen 4 Multi V cassette indoor units, DIP Switches 1, 2, 6 through 8 must be set to OFF. These DIP switches are used for other models.**

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

⚠ 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.

Cable Connections

1. Ensure the input power is disconnected and there is no power on the power input cable.
2. Refer to Figure 31 and route the power and outdoor unit communications cables to the unit's terminal block. Do not route the communications cable near the power cable.
3. Connect the power cable to the 1(L1) and 2(L2) terminal block connections. Ensure the screws securely connect the wire to the terminals and are not loose.
4. Connect the field-provided outdoor unit communications cable to the 3(A) and 4(B) terminal block connections. This cable must be 18-2, stranded, shielded, and meet all applicable codes. Polarity matters on this IDU to ODU communications bus. Be sure to connect A terminals to A terminals and B terminals to B terminals. Ensure the communication cable is properly grounded at the master outdoor unit only. Do not ground this IDU to ODU communications cable at any other point.
5. If the unit has a wall-mounted zone controller, connect the controller's cable to the unit's remote control connection. On some units this cable connects to a pigtail cable from the CN-REMO connector on the control board and on some units it connects directly to the CN-REMO connector.

Figure 31: Typical TT, TU Chassis Cable Connections

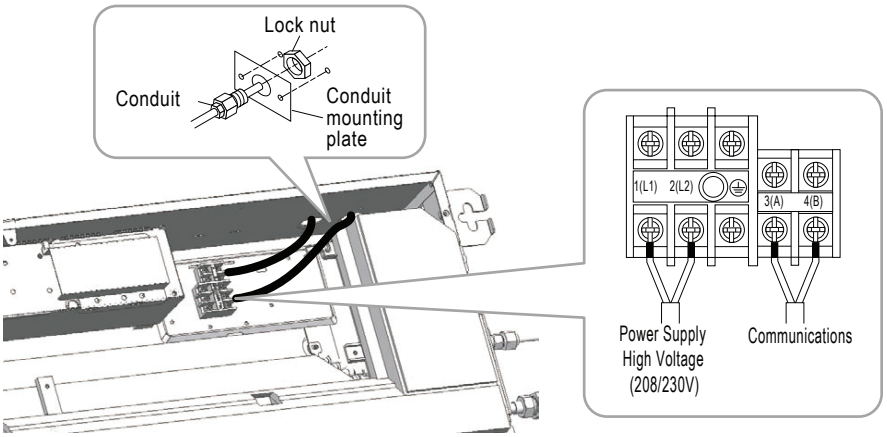


Figure 32: TT, TU Chassis Wiring Diagram

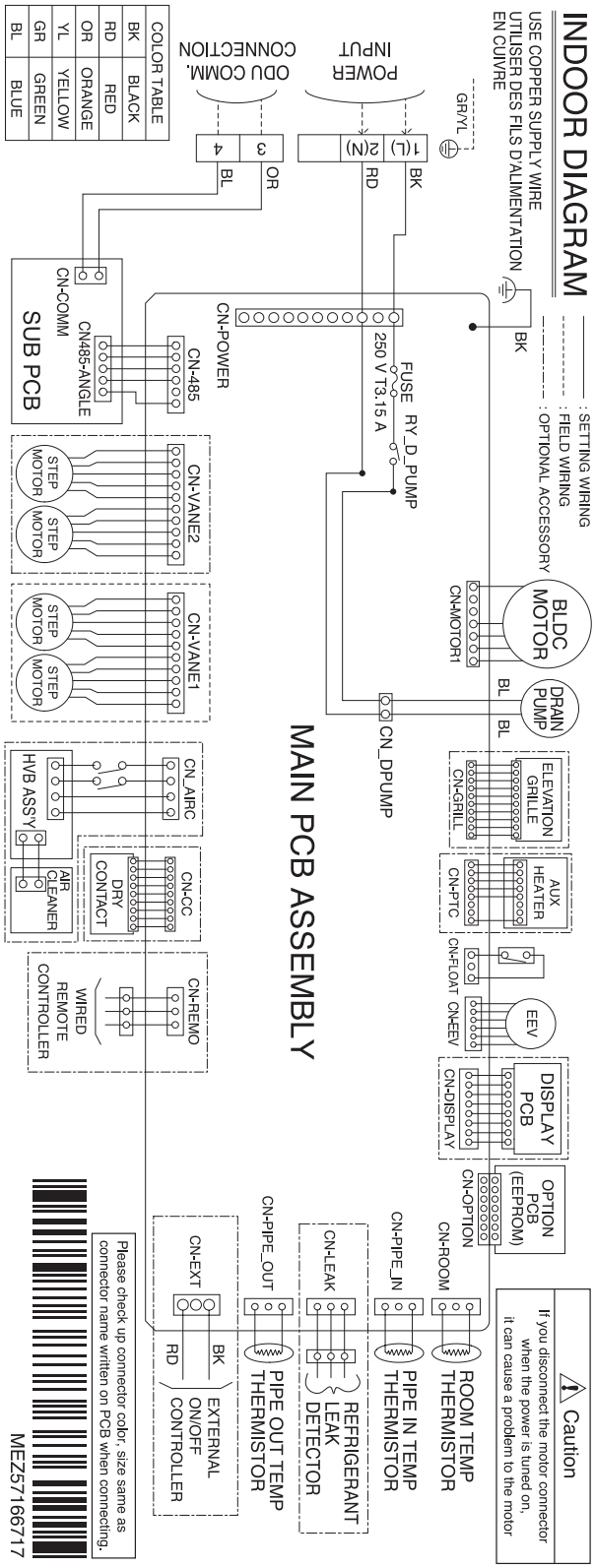


Table 11: TT, TU Chassis Wiring Diagram Connectors

CONNECTOR	PURPOSE	FUNCTION
CN-POWER	AC Power supply	AC Power line input for indoor controller
CN-MOTOR1	Fan motor output	Motor output of BLDC
CN-D/PUMP	Drain pump output	AC output for drain pump
CN-PTC	Auxiliary heater	Auxiliary heater connection
CN-FLOAT	Float switch input	Float switch sensing
CN-EEV	EEV output	EEV Control output
CN-DISP	Display	Display of indoor status
CN-OPTION	Option PCB (EPROM)	Option PCB connection
CN-ROOM	Room sensor	Room air thermistor
CN-PIPE/IN	Suction pipe sensor	Pipe in thermistor
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 line
CN-CC	Dry Contact	Connection to Dry Contact (Optional)
CN-AIRC*	Air cleaner*	Air cleaner control*
CN-VANE1	Step Motor	Step motor output
CN-VANE2	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

*Plasma filter kit accessories are available separately. Always follow all local, state, and national building codes with the use of this or any product.

Table 12: TT, TU Chassis DIP Switch Settings

Switch	Function	OFF	ON	Description
3	Group Control	Master	Slave	Selects master or slave operation for the IDU
4	Dry Contact	Variable	Auto	Selects mode of operation for optional dry contact: 1. Variable: Auto or Manual mode can be set with a 7-day programmable controller or wireless remote controller (factory setting is Manual) 2. Auto: Selects Auto mode

***For Gen 4 Multi V cassette indoor units, DIP Switches 1, 2, 6 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 IV, Multi V Water IV Engineering Manual for additional information.**

Wall-Mounted Sensor Installation

Proper indoor unit operation depends on the location of the room sensor. A good location will protect the zone controller from direct sunlight and external local sources of water vapor, and heated or cooled air. If no mounting height was specified by the building designer, place the handy box approximately fifty-five (55) inches above the finished floor.

- It may be necessary to use a handy box that is sized in metric units, depending on the controller model. Check with your LG representative to verify which size of handy box is needed for the zone controller in question.
- Use only LG-supplied communications cable. Using field-supplied cable may result in communications problems between the zone controller and the indoor unit.
- Maintain the minimum distance required between the communications cable and power wiring. The minimum required space between the two is dependent on the voltage of the power wiring. Refer to the appropriate Multi V Outdoor Unit Engineering Manual for minimum distance specifications.

⃠ Do not route power wiring and communications cables in the same conduit.

⃠ 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.

Wall-Mounted Controller Installation

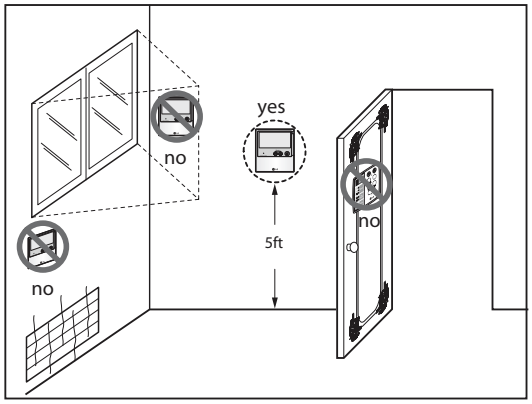
Since the room temperature sensor is inside the remote controller, the remote controller should be installed in a place away from direct sunlight, high humidity and direct supply of hot or cold air to maintain proper space temperature. Install the remote controller about 5 ft above the floor in an area with good air circulation and an average temperature.

⃠ Do not install the remote controller where it can be affected 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

This remote controller is equipped with a seven segment LED display. For proper display of the remote controller LED's, the remote controller should be installed properly as shown below. The standard height is 4 - 5 ft from floor level.

Figure 33: Wired Remote Controller Installation



1. Pull communications cable between the zone controller handy box (if used) and the indoor unit. The wall-mounted zone controller comes with a thirty (33) foot length of cable.
2. Store a minimal amount of cable in the handy box. Any additional cable should be coiled and stored near the indoor unit control panel.
3. If additional cable length is needed, order a thirty (33) foot LG Wired Remote Group Control Extension cable (Model No. PZCWRC1).
4. If the cable between the zone controller and the indoor unit is too long, do not cut the cable and shorten. Coil any spare communications cable, tie-wrap it, and leave it next to the indoor unit location.

Decoration Panel Installation

Note:

An optional plasma filter is available for this IDU. If used, install the optional plasma filter before installing the decoration panel. Refer to the installation instructions in the optional plasma filter kit.

1. Install two decoration panel attaching screws on the cassette chassis. Tighten about 3/8 inch.
2. Remove the air inlet grille from the decoration panel. (Remove the hook for the air inlet grille cord.)
3. Hook the decoration panel 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 34: Decoration Panel Installation

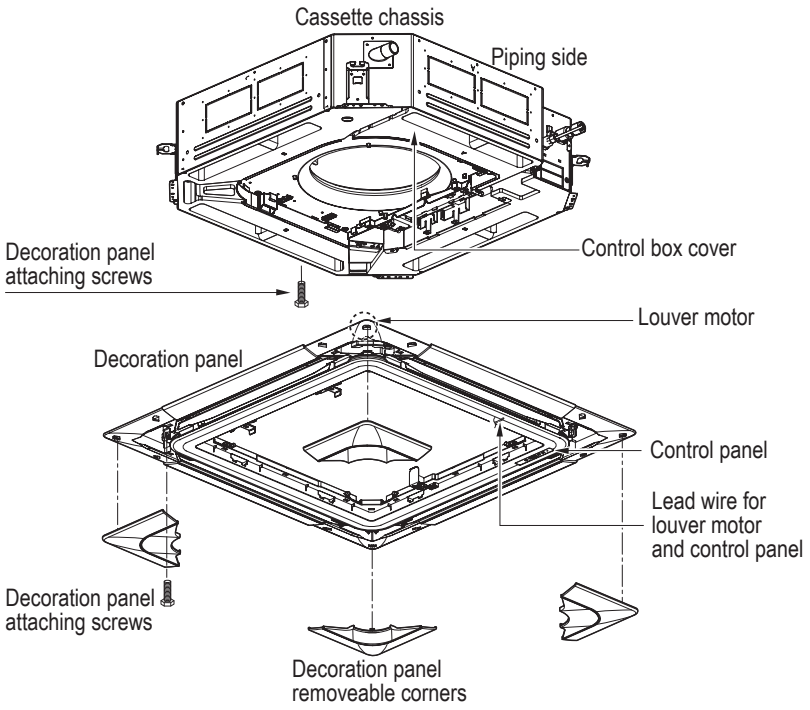


Figure 35: Swing Inlet Grill Downward

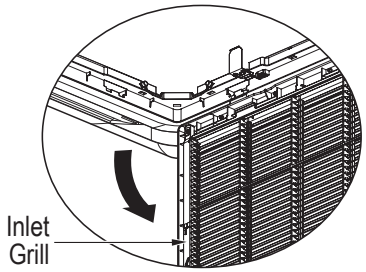
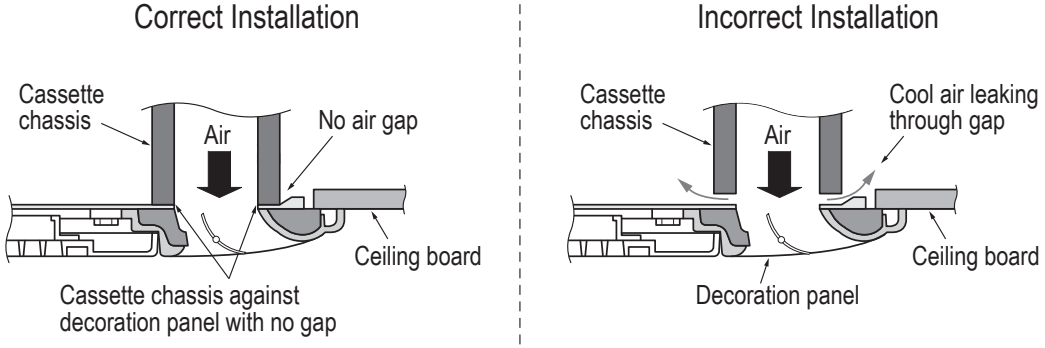


Figure 36: Properly Seating Decoration Panel against Chassis



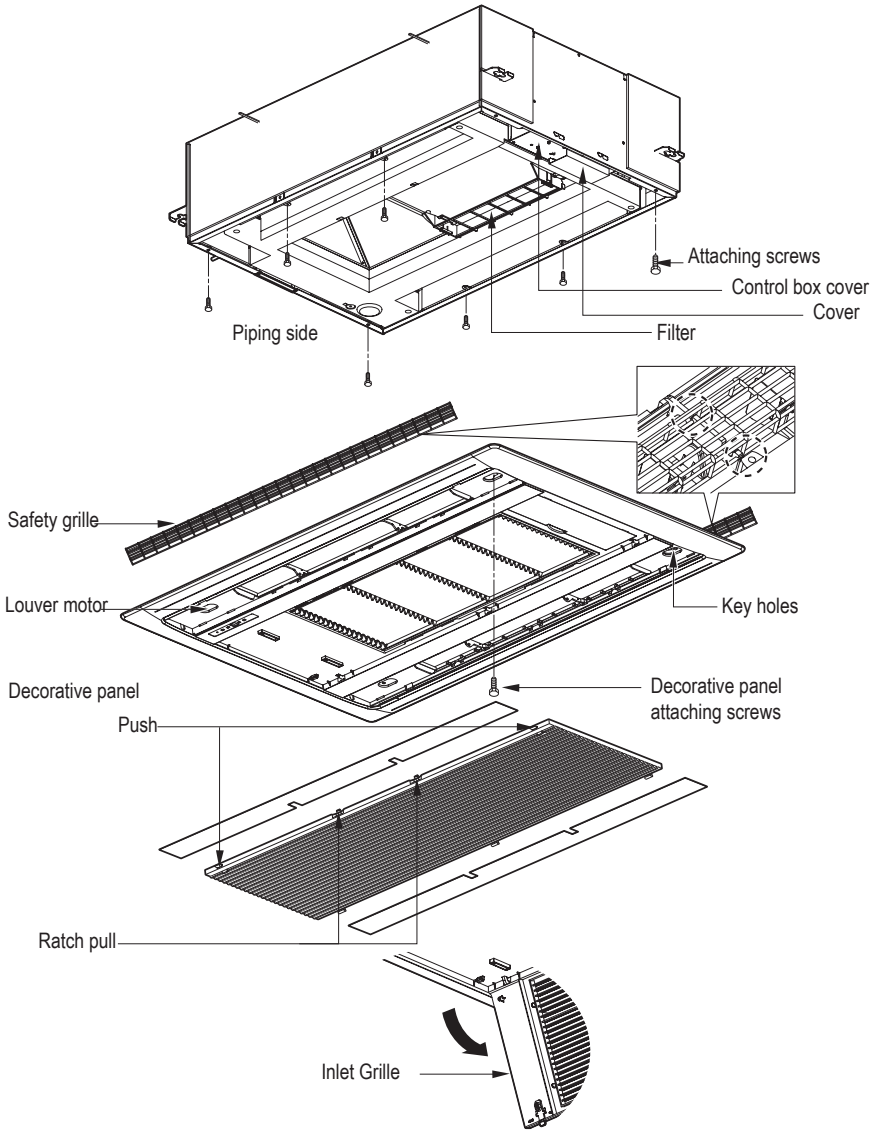
2-Way Decoration Panel Installation

Note:

An optional plasma filter is available for this IDU. If used, install the optional plasma filter before installing the decoration panel. Refer to the installation instructions in the optional plasma filter kit.

1. Install two decoration panel attaching screws on the cassette chassis. Tighten about 3/8 inch.
2. Remove the air inlet grille from the decoration panel. (Remove the hook for the air inlet grille cord.)
3. Hook the decoration panel 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 37: Decoration Panel Installation



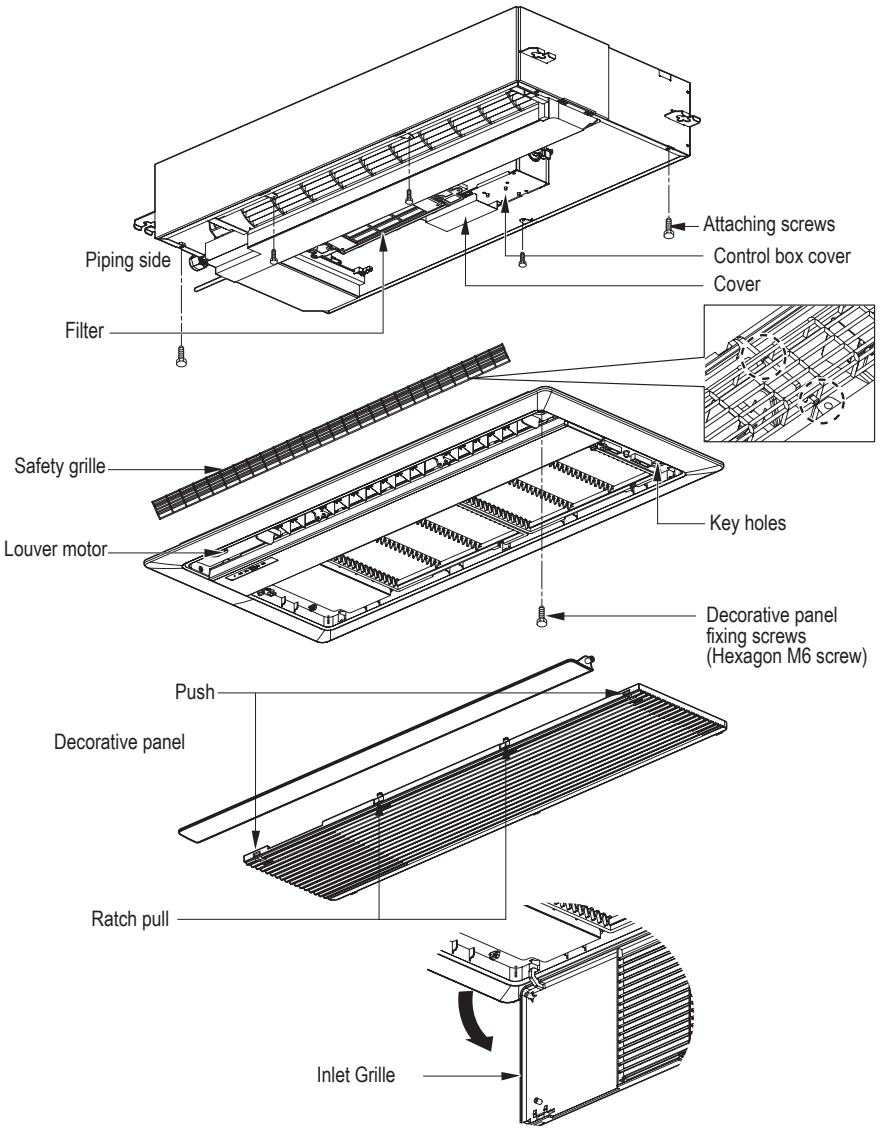
1-Way Decoration Panel Installation

Note:

An optional plasma filter is available for this IDU. If used, install the optional plasma filter before installing the decoration panel. Refer to the installation instructions in the optional plasma filter kit.

1. Install two decoration panel attaching screws on the cassette chassis. Tighten about 3/8 inch.
2. Remove the air inlet grille from the decoration panel. (Remove the hook for the air inlet grille cord.)
3. Hook the decoration panel 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 38: Decoration Panel Installation



Controlling the Indoor Unit

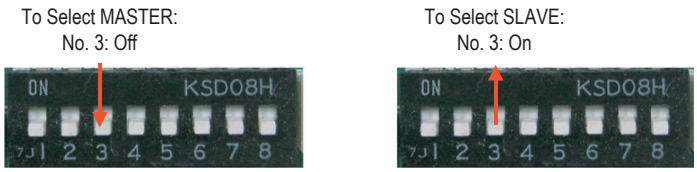
The method and configuration of controlling the indoor unit will vary according to your system's requirements.

- It is possible to control up to 16 indoor units with one wired remote controller.
- Set only one indoor unit in a group to master; set the others to slave.
- This indoor unit can be connected in a control group with any other types of LG indoor units.
- It is possible to use a wireless remote controller at the same time as the wall controller.
- It is possible to connect a dry contact and central controller 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 can not be individually controlled by the central controller.

DIP Switch Settings

Refer to Figure 39. 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. To ensure the remaining switches are set correctly, refer to the appropriate unit's DIP switch settings in the wiring section of this manual.

Figure 39: Cassette IDU Master/Slave DIP Switch Settings



***For use with Multi V systems, switches 1, 2, 6, and 8 MUST be set to Off for cassette IDUs.**

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

Ceiling Height Setting

Set the airflow rate of the ceiling cassette indoor unit according to the height of the room's ceiling. Refer to Table 13 for ceiling height dimensions and the corresponding airflow setting. Use the cassette unit's 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 13: Ceiling Height Settings

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

Generation 4 Equipment

The latest versions of LG's indoor units and outdoor (air/water source) units are designated Generation 4 (Gen 4). For Gen 4 units to operate with Gen 4 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.
- All air/water source units must have Gen 4 software installed.
- Air/water source units DIP switch 3 must be set to ON (factory default setting is OFF).
- All controllers must support Gen 4 features.

Figure 39 shows the ODU DIP switch. Figure 38 lists how combining different components will affect system operation. Table 18 lists the serial numbers of air and water source units that have Gen 4 software. 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 features.

Figure 40: Location and Setting of ODU DIP Switch 3

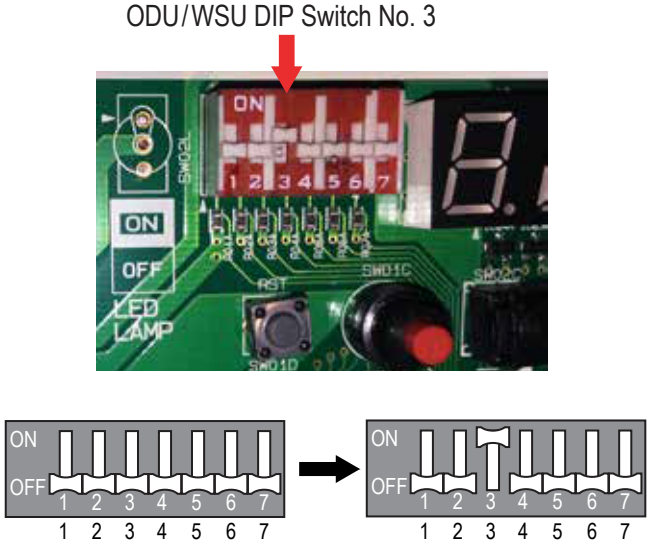


Table 14: System Component Combinations and Operation Status

Air/Water Source Units*	Indoor Unit(s)**	Heat Recovery Unit(s)	Outdoor Unit DIP Switch No. 3	Operation Status
Gen 4	Gen 4 ONLY	Model 2A ONLY	Must be ON	System will operate WITH Gen. 4 features.
Gen 4	Gen 4 ONLY	Model 2A ONLY	OFF	System will operate but WITHOUT Gen. 4 features.
Gen 4	Gen 4 ONLY	Any combination of Models 0A, 1A, 2A	Must be OFF (factory default)	Does NOT include Gen. 4 features. System will not operate if DIP Switch No. 3 is ON, and an error code will be generated.
Gen 4	Any combination of Gen 2 and Gen 4	Model 2A ONLY	Must be OFF (factory default)	
Gen 4	Any combination of Gen 2 and Gen 4	Any combination of Models 1A, 2A	Must be OFF (factory default)	
Gen 2	Any combination of Gen 2 and Gen 4	Any combination of Models 1A, 2A	N/A***	Does not include Gen. 4 features.

*Gen 4 Air/Water Source Units = Multi V IV or Multi V Water IV with Gen 4 software (see table below for Gen 4 serial numbers) or Multi V S. Gen 2 Air/Water Source Units = Multi V II, Multi V III, Multi V IV without Gen. 4 software, Multi V Water II, Multi V Water IV without Gen. 4 software, Multi V Mini, Multi V Water Mini, or Multi V Space II.

**Gen 4 Indoor Units model numbers end in "4"; Gen 2 Indoor Units model numbers end in "2" or an "A", including Hydro Kit.

***DIP Switch No. 3 on Gen 2 air/water source units is not related to Gen 4 features as it is with Gen 4 air/water source units.

****0A Model HRUs will not operate with Gen 4 or Gen 2 Air/Water source units without software upgrade.

Table 15: Serial Numbers of Air/Water Source Units with Gen 4 Software

Air/Water Source Unit Model Type	Multi V IV Air Source Heat Pump	Multi V Air Source Heat Recovery	Multi V IV Water Source Heat Pump	Multi V IV Water Source Heat Recovery
Serial Number of Air/Water Source Units with Gen 4 Software	502********* and Higher	503********* and Higher	504********* and Higher	

Group Control

Figure 41, Figure 42, and Figure 43 show examples of typical control configurations. Figure 41 shows one wired remote controller configured as a Master to control a group of indoor units. Figure 42 shows two wired remote controllers, one configured as a Master and the other as a Slave. Figure 43 shows a system with indoor units and fresh air units configured as two groups, each with a Master wired controller. Configure the fresh air units as one group and the standard indoor units as another group. Figure 44 shows both a correct and an incorrect control configuration for this type of mixed unit system.

Figure 41: Group Control - Method 1

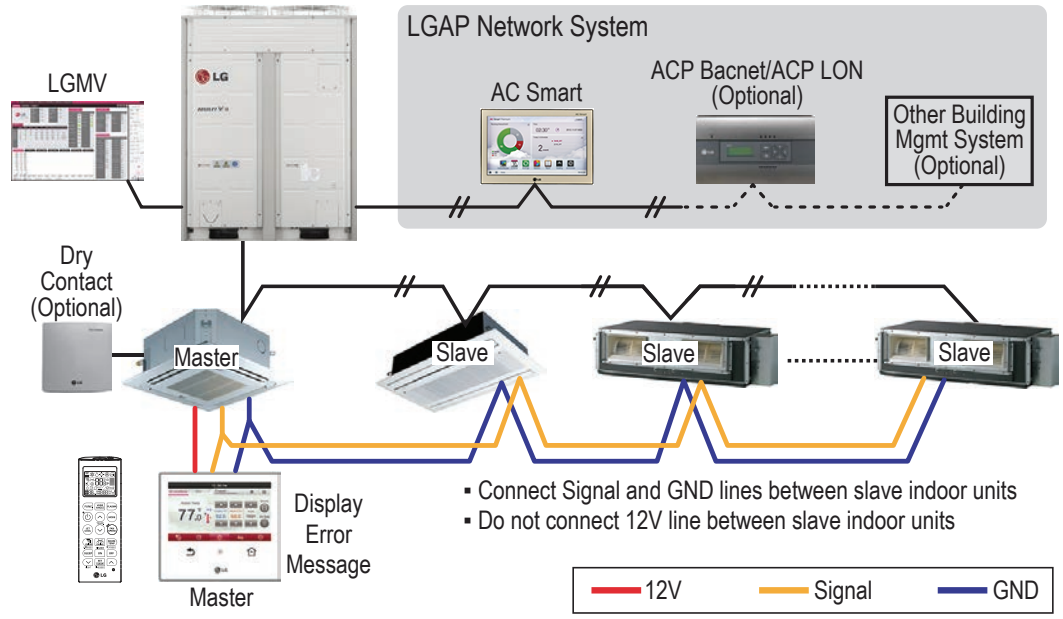


Figure 42: Group Control - Method 2

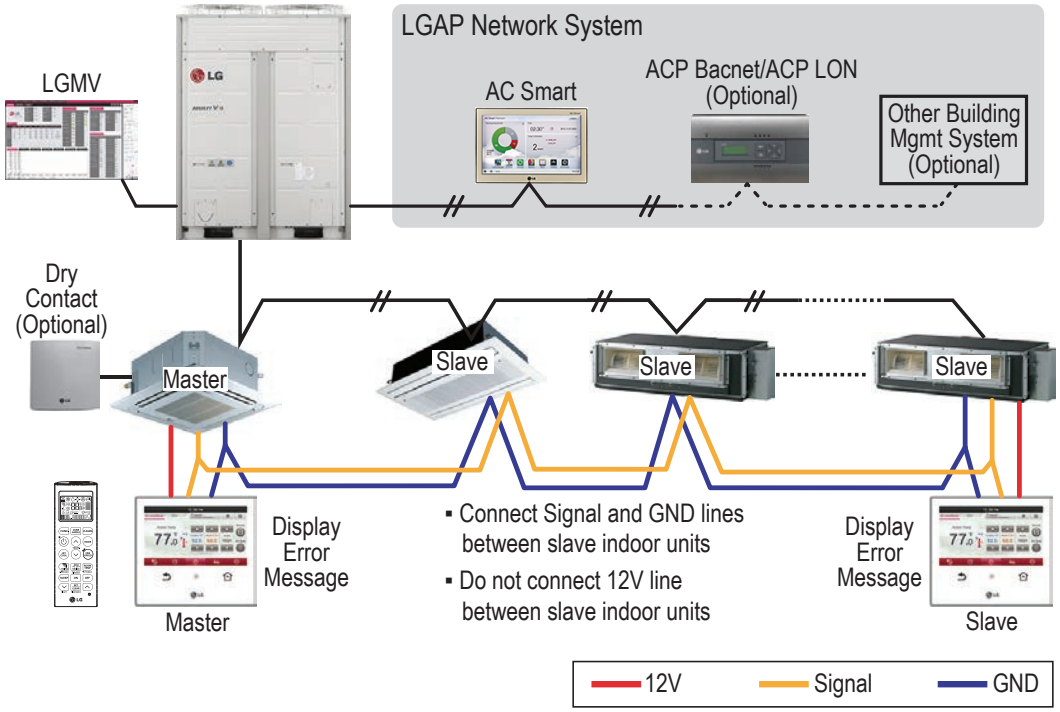


Figure 43: Group Control - Method 3

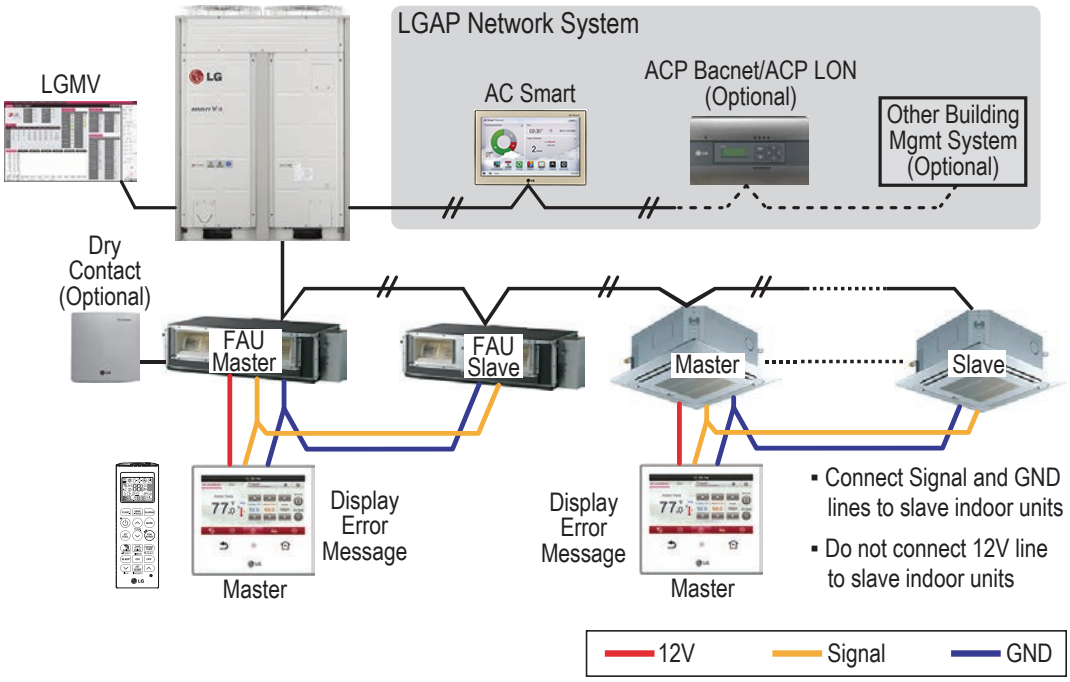
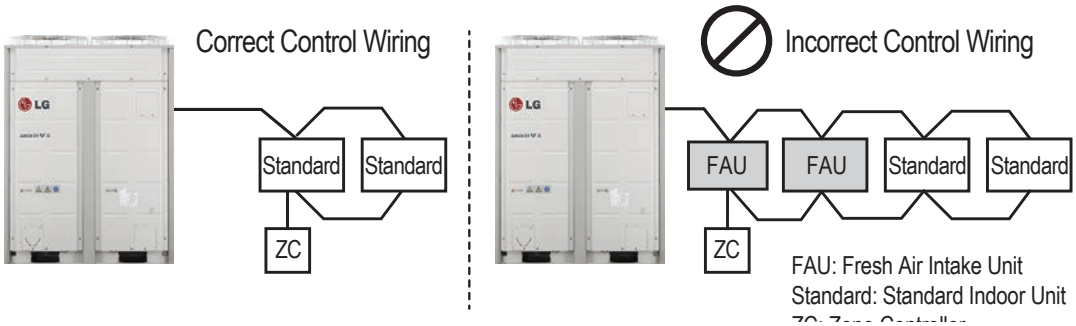


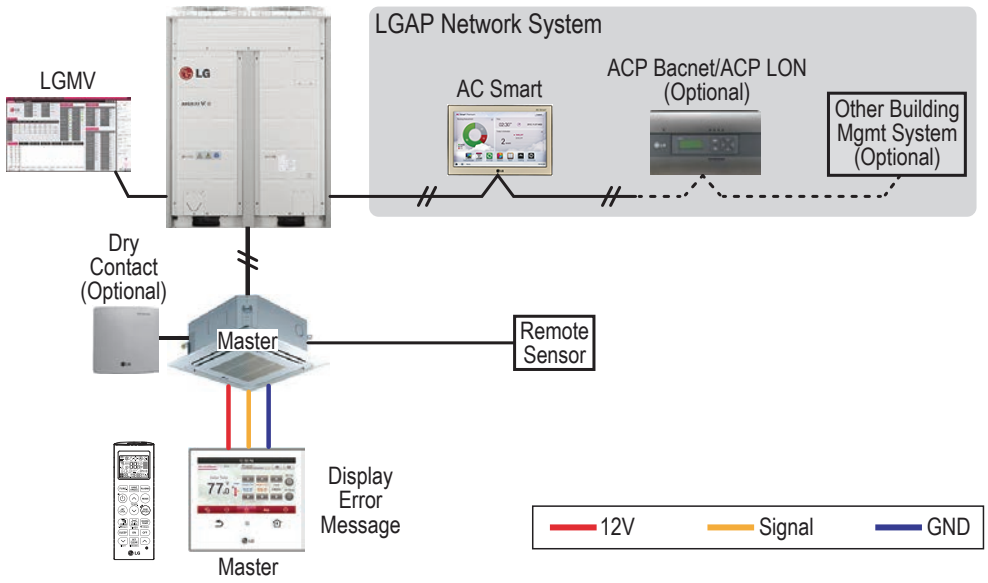
Figure 44: Control Wiring with Standard IDU and Fresh Air Unit



Remote Control

Figure 45 shows an example of a remote control configuration.

Figure 45: Remote Control



INSTALLATION CHECKLIST

MULTI V™

System ID No.: _____ Indoor Unit ID.: _____

Checked by: _____ Date:_____ Signature:_____

Rough-In	N/A	Not Complete	Complete
Packing materials and literature removed from 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).			
Recommended 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?			
Ductwork	**N/A**	**Not Complete**	**Complete**
All seams sealed – no air leaks.			
High-static models only – minimum external static pressure requirements met.			
Ductwork is properly sized considering the available external static pressure rating of the indoor unit fan.			
No kinks present in the flexible ductwork. Ductwork is properly supported.			
Ductwork balancing dampers have been installed and are correctly adjusted or open.			
Grilles and registers are properly sized and installed.			
Refrigerant Piping	**N/A**	**Not Complete**	**Complete**
A dry nitrogen purge rate of three (3) psig was maintained during all brazing activity.			
PVE refrigerant oil was used as a lubricant on flare fittings (POE type was NOT used).			
Field formed pipe flares are 45°.			
Flare fittings were properly tightened with a torque wrench.			
Refrigerant pipe is properly supported to keep lateral pressure off unit connections.			
Refrigerant shutoff valves are full port design with integral Schrader port rated for R410A (option).			
Shutoff valves have the same internal pipe diameter as the connected pipe (option).			
Two shutoff valves were installed; one (1) high pressure liquid, one (1) low pressure vapor (option).			
Shutoff valves installed with Schrader port between the indoor unit and the ball of the valve (option).			
Condensate System	**N/A**	**Not Complete**	**Complete**
Condensate pipe is properly sized and supported to keep lateral pressure off unit connections.			
Condensate pipe horizontal segments are sloped a minimum of 1/4"/100' of pipe away from the indoor unit.			
Condensate pipe and drain traps were sized using LG recommendations.			
Field-provided condensate line check valve was installed in the condensate pipe riser (option).			
Condensate traps were installed on gravity drain pipes (High-Static models only).			
Condensate line vertical rise between indoor unit bottom and high point of the line does not exceed 27-1/2".			
Condensate pump power has been disconnected (High-Static indoor unit gravity-drain installations only).			
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	**N/A**	**Not Complete**	**Complete**
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 pipes are independently insulated. All insulation seams and joints are airtight. Insulation is not compressed. Double layer insulation is provided at pipe supports and wall penetrations.			

LG

INSTALLATION CHECKLIST

System ID No.: _____ Indoor Unit ID.: _____

Checked by: _____ Date:_____ Signature:_____

Electrical	N/A	Not Complete	Complete
Power provided is single phase, ±10% of indoor unit nameplate specifications.			
Power wires properly sized and protected per NEC and local codes. Indoor unit is properly grounded.			
Power and communications conductors are separated by the recommended minimum distance.			
Terminal block screws are tight. Power wires are not in contact with terminals 3(A) and/or 4(B). Line voltage wires have fork terminals installed.			
Power wires are properly secured to the control box case to prevent wire tension at the terminal block.			
Wires are protected from chaffing at control box and conduit pipe penetrations.			
(Optional) Smoke detector is properly installed and wired. New batteries are installed (if applicable).			
Low voltage control cables are properly secured to the control panel case. Terminal block screws are tight and the cable is protected from sharp edges at control box case and conduit openings.			
Cables are installed at recommended distances from high voltage and EMF generating equipment.			
Outdoor unit / Indoor unit communications cable (terminals 3[A] and 4[B] or terminals 5[A] and 5[B] depending on model).			
Field provided communications cable is 18-2 stranded and shielded. All terminations are made at the terminal block using fork terminals. No inline splices or wire nuts are present.			
Communications cable is plenum rated.			
Communications cable shield is tied back and is grounded at master only ONE end (at the master ODU).			
Wall Mounted Zone Controller Communications	**N/A**	**Not Complete**	**Complete**
LG factory provided zone controller stranded, shielded (white jacket) cable was used between the zone controller(s) and indoor unit(s).			
Zone controller cable has not been cut, spliced, or tied together with wire nuts. Factory plugs are present.			
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	**N/A**	**Not Complete**	**Complete**
Zone controller cable is securely plugged into the CN-REMO socket on the indoor unit circuit board.			
If an optional remote temperature sensor was installed, the associated cable is plugged into socket CN-ROOM (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).			
If a gravity drain primary condensate system is used (condensate pipe ONLY connected to the lowest nipple) the CN-D/Pump plugged has been removed from the socket on the control board (High-Static models only).			
All plugs are properly seated in the sockets on the control board.			
Power and communications cables are properly restrained and separated.			

Who to call for assistance

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

For warranty information, visit www.lghvac.com.

LG Electronics
Commercial Air Conditioning Division
4300 Northpoint Parkway
Alpharetta, Georgia 30022
www.lghvac.com

LG Customer Information Center, Commercial Products

1-888-865-3026 USA

Follow the prompts for commercial A/C products and parts.

IM_MultiV_CeilingCassette_IDU_9_16
Supercedes: IM_MultiV_CeilingCassette_IDU_2_16
Supercedes: IM-MultiV-IV-CeilingCassette-01-15