LG MULTI-V INFORMATION

LG Product Overview

How to Read LG Outdoor Unit Model Numbers

ARU	M	072	B	T	E	5

- Family
  - ARU = Multi V Outdoor Unit
- Type
  - N = Inverter Heat Pump
  - B = Inverter Heat Recovery
  - M = Inverter HP/HR
- Nominal Capacity (Nominal Cooling Capacity in Btu/h)

072 = 72,000	336 = 336,000
096 = 96,000	312 = 312,000
121 = 121,000	360 = 360,000
144 = 144,000	384 = 384,000
168 = 168,000	408 = 408,000
192 = 192,000	432 = 432,000
216 = 216,000	456 = 456,000
240 = 240,000	480 = 480,000
264 = 264,000	504 = 504,000
288 = 288,000	

- Electrical Ratings
  - B = 208–230V/ 60Hz/3Ph
  - D = 460V /60Hz/3Ph
- Airflow Configuration
  - T = Top Discharge
- Efficiency
  - E = High Efficiency
- Generation
  - 4 = Fourth
  - 5 = Fifth

START UP FOR MULTI V HEAT PUMP (NON HEAT RECOVERY)

*MODEL NUMBER WILL HAVE A ‘N’ FOR HEAT PUMP ONLY MODELS, NO NEED TO SET AS HEAT PUMP, MODELS WITH A ‘B’ ARE HEAT RECOVERY **ONLY***

Setting Outdoor Units to Heat Pump or Heat Recovery Systems

Outdoor units are factory set to heat recovery operation—all switches on DIP Switch bank SW01 are set to OFF. **All outdoor unit(s) (master and slave[s]) MUST be manually set to a heat pump system.** To change the factory set heat recovery system to a heat pump system:

- Flip switch No. 4 on the DIP-SW01 bank to ON. Display will show "HR" (heat recovery).
- Push the ▶ (SW03C) button to change "HR" (heat recovery) to "HP" (heat pump), then press the confirm (SW01C) button.
- Flip switch No. 4 on the DIP-SW01 bank to OFF, and push the reset (SW01D) button to restart the system. If No. 4 on the DIP-SW01 bank is switched to ON again, "HR" (heat recovery) or "HP" (heat pump) can be verified by reading the display later.

Figure 131: Heat Recovery System DIP Switch Setting on Outdoor Units (Factory Set).

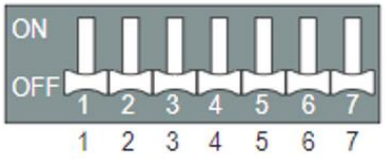

Figure 132: Heat Pump System DIP Switch Setting on Outdoor Units (Manually Set).

LG Product Overview

How to Read LG Outdoor Unit Model Numbers

ARU	M	072	B	T	E	5

- Family
  - ARU = Multi V Outdoor Unit
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- Electrical Ratings
  - B = 208–230V/ 60Hz/3Ph
  - D = 460V /60Hz/3Ph
- Airflow Configuration
  - T = Top Discharge
- Efficiency
  - E = High Efficiency
- Generation
  - 4 = Fourth
  - 5 = Fifth

LG Product Overview

How to read LG Heat Recovery Unit Model Numbers

PRHR	04	2A

- Family
  - PRHR = Multi V Heat Recovery
- Number of Connection Ports
  - 02 = Two Ports
  - 03 = Three Ports
  - 04 = Four Ports
- Series Number
  - 2A = Series Number

MULTI-VS PIPING

ENGLISH

Nitrogen substitution method

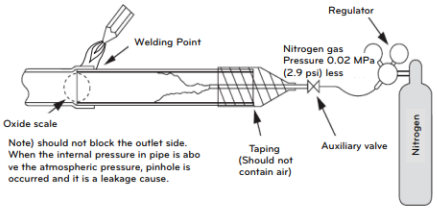
Welding, as when heating without nitrogen substitution a large amount of the oxide film is formed on the internal piping.

The oxide film is a caused by clogging EEV, Capillary, oil hole of accumulator and suction hole of oil pump in compressor.

It prevents normal operation of the compressor.

In order to avoid this problem, Welding should be done after replacing air by nitrogen gas.

When welding plumbing pipe, the work is required.



⚠ CAUTION

- Always use the nitrogen.(not use oxygen, carbon dioxide, and a Chevron gas): Please use the following nitrogen pressure 0.02 MPa (2.9 psi) Oxygen - Promotes oxidative degradation of refrigerant oil. Because it is flammable, it is strictly prohibited to use Carbon dioxide - Degrade the drying characteristics of gas Chevron Gas - Toxic gas occurs when exposed to direct flame.
- Always use a pressure reducing valve.
- Please do not use commercially available antioxidant. The residual material seems to be the oxide scale is observed. In fact, due to the organic acids generated by oxidation of the alcohol contained in the anti-oxidants, ants nest corrosion occurs. (causes of organic acid ⟶ alcohol + copper + water + temperature)

REFRIGERANT PIPING INSTALLATION

For Heat Recovery System Installation

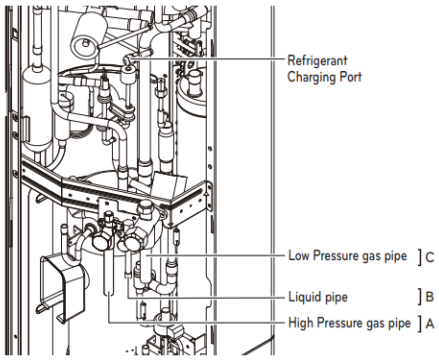
Precautions on Pipe connection / Valve operation

Pipe connection is done by connecting from the end of the pipe to the branching pipes, and the refrigerant pipe coming out of the outdoor unit is divided at the end to connect to each indoor unit. Flare connection for the indoor unit, and welding connection for the outdoor pipe and the branching parts. (Including HR Unit)

* Pipes and wires should be purchased separately for installation of the product.

- Use hexagonal wrench to open/close the valve.

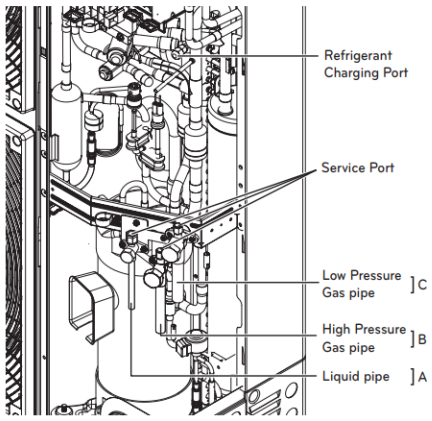
ARUB*GSS4**



- Refer to the table below and install with the correct pipe diameter.

	Heat Recovery	Heat Pump
A[mm(inch)]	Ø15.88(5/8)	-
B[mm(inch)]	Ø9.52(3/8)	-
C[mm(inch)]	Ø19.05(3/4)	-

ARUM*GSS5**



- Refer to the table below and install with the correct pipe diameter.

	Heat Recovery	Heat Pump
A[mm(inch)]	Ø9.52(3/8)	Ø9.52(3/8)
B[mm(inch)]	Ø15.88(5/8)	Ø15.88(5/8)
C[mm(inch)]	Ø19.05(3/4)	Not Used*

* In case of heat pump installation, please weld with the proper Low pressure Gas pipe included with product.

Piping Connections for Heat Pump Operation

Use the correct outdoor unit connections to join the outdoor unit to the branch piping in the indoor unit refrigeration system.

Flare connections are used to connect the piping on the indoor units, and braze connections are used to connect the piping on the outdoor unit (see piping dimensions below), Y-branches, and headers.

Multi V S with LGRED outdoor units designed for heat pump operation use only the liquid pipe and vapor pipe connections as shown in the diagram below. For heat pump operation, the right side pipe is NOT used and must be kept closed and capped.

Figure 62: Piping Connections for Heat Pump Operation.

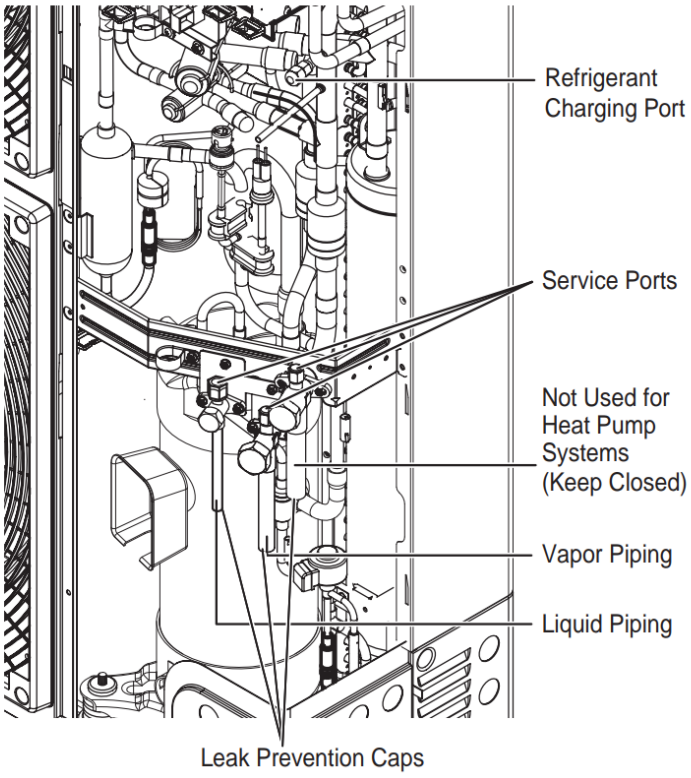


Table 24: Heat Pump Outdoor Unit Refrigerant Piping Connections.

Model	Liquid Conn. (in.)	Type	Vapor Conn. (in.)	Type
ARUM036GSS5	3/8	Brazed	5/8	Brazed
ARUM048GSS5	3/8	Brazed	5/8	Brazed

⚠WARNING

It is important that the correct outdoor unit connections be used for the intended system operation (heat pump versus heat recovery). If the wrong connections are used, it will result in refrigerant leaks, which will lead to illness or death.

Note:

It is important that the correct outdoor unit connections be used for the intended system operation (heat pump versus heat recovery). If the wrong connections are used, it will result in refrigerant leaks, which will lead to system malfunction or even failure to work at all.

MULTI-V5 PIPING

INSTALLING FOR HEAT PUMP OPERATION

MULTI V 5 WITH LGRED

Removing the Leak Prevention Caps

Removing the Leak Prevention Caps

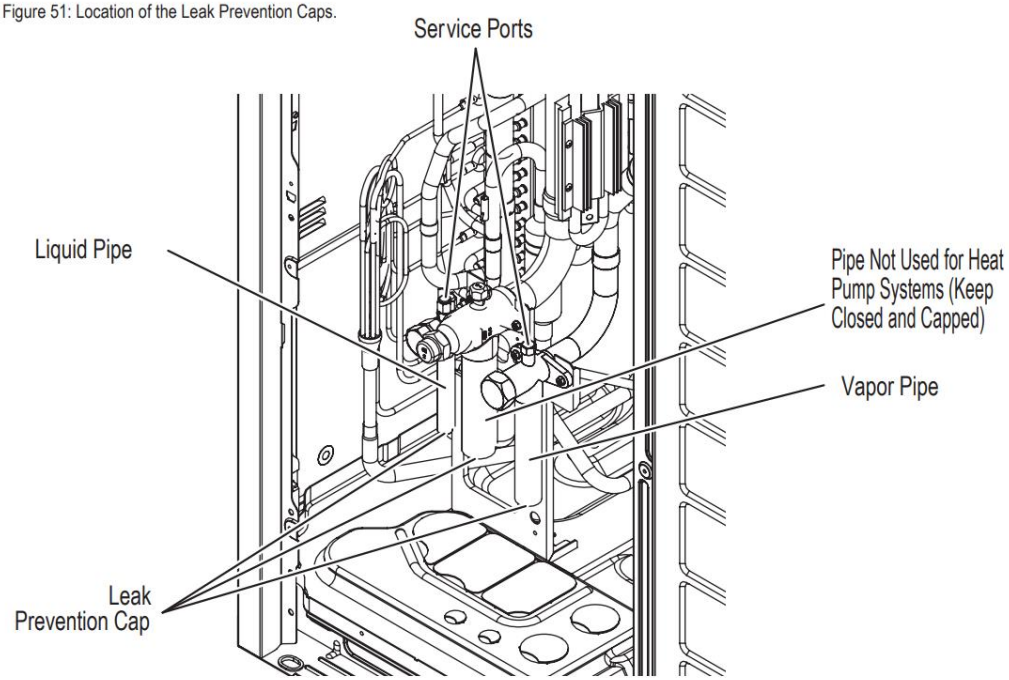
Before brazing the field-supplied refrigerant piping to the outdoor unit connections, the leak prevention caps must be removed from the liquid and vapor pipe connections.

Note:

For heat pump operation, the middle pipe is NOT used, must be kept closed, and a field-supplied copper cap must be brazed onto it before system is operated. Protect the service valve with a wet towel during brazing.

- Verify that the valve stems in the service ports are closed (see the "Service Port" section).
- Remove the leak prevention caps from the liquid and vapor pipe outdoor unit connections.
- Use the Schrader valves on the liquid and vapor pipes to perform the leak / pressure, triple evacuation, and trim charge procedures.

Figure 51: Location of the Leak Prevention Caps.



Note:

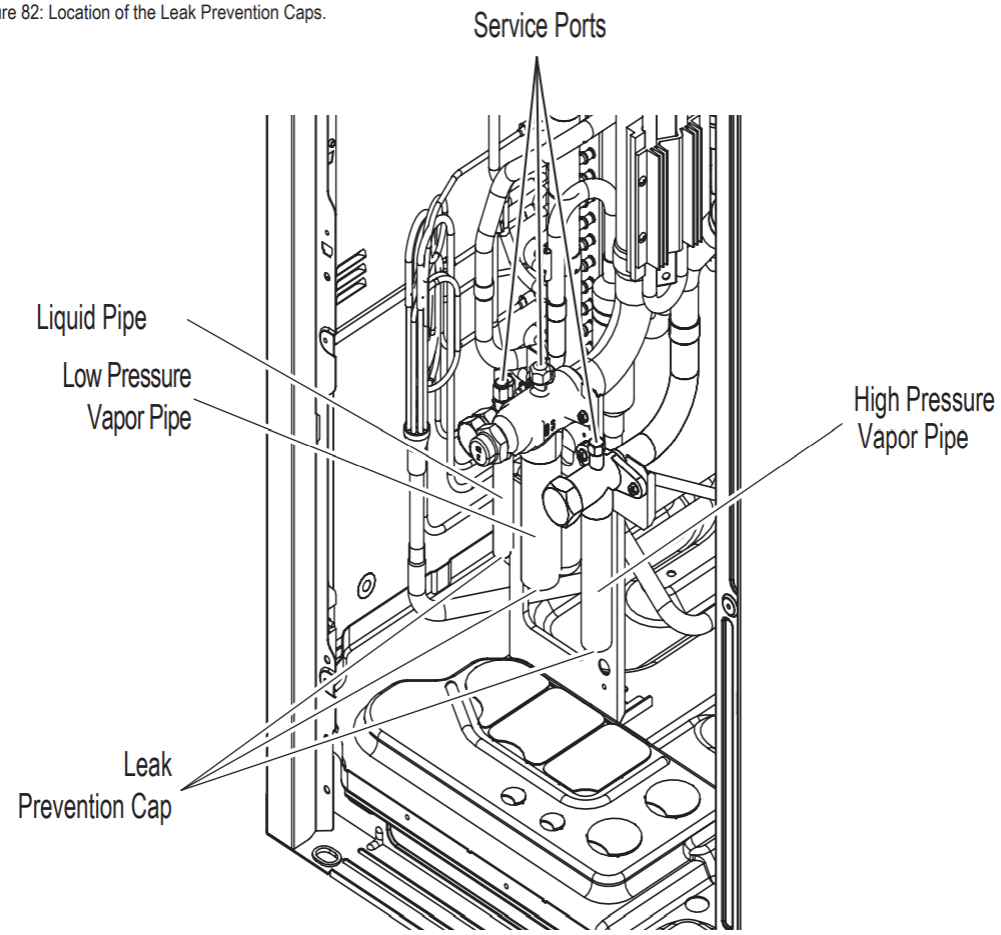
Line connection dimensions in the specification tables and in LATS are field piping dimensions, NOT the dimensions on the outdoor unit connections themselves. Adapters will be needed to connect the field piping to the correct outdoor unit connection (adapters are factory supplied with the outdoor unit).

Removing the Leak Prevention Caps

Before brazing the field-supplied refrigerant piping to the outdoor unit connections, the leak prevention caps MUST be removed from the liquid, high pressure vapor, and low pressure vapor pipe connections.

- Verify that the valve stems in the service ports are closed (see the "Service Port" section).
- Remove the leak prevention caps from the liquid, high pressure vapor, and low pressure vapor pipe outdoor unit connections.
- Use the Schrader valves on the liquid, high pressure vapor, and low pressure vapor pipes to perform the leak / pressure, triple evacuation, and trim charge procedures.

Figure 82: Location of the Leak Prevention Caps.



Note:

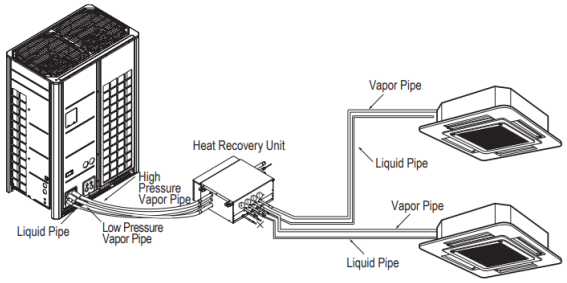
Line connection dimensions in the specification tables and in LATS are field piping dimensions, NOT the dimensions on the outdoor unit connections themselves. Adapters will be needed to connect the field piping to the correct outdoor unit connection (adapters are factory supplied with the outdoor unit).

PIPING HR BOXES MULTI-V S & 5

Heat Recovery System Piping

Heat recovery systems have three pipes (liquid, high pressure vapor, low pressure vapor) running from the outdoor unit to the heat recovery unit, then two pipes (liquid, vapor) running from the heat recovery unit to the connected indoor units.

Figure 71: Simplified Diagram of Heat Recovery System Piping.

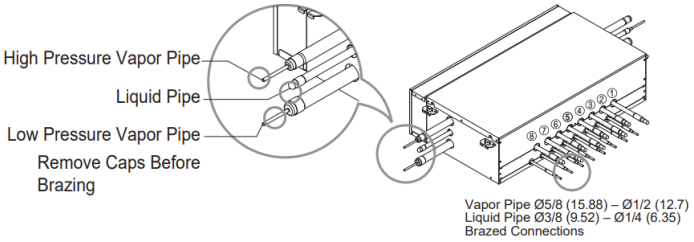


Heat Recovery Unit Connections and Limitations

Note:

1. *Series connection of heat recovery units: Total capacity of indoor units ≤230,000 Btu/h.*
2. *Refer to the heat recovery unit PCB for valve group control setting.*
3. *Maximum capacity of each port is 60,000 Btu/h and eight (8) indoor units.*
4. ⃠ *Do not skip ports when connecting indoor units. Start at port 1, then use 2, then use 3, then use 4, etc. (the numbers are displayed on the heat recovery ports).*

Figure 72: Close Up of the Heat Recovery Unit Connections.



MULTI-V WIRING

LG MULTI V “DAISY CHAIN”

ELECTRICAL

Communication Cable Specifications

MULTI V 5 WITH LGRED

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

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

⚠WARNING

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

Note:

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

Figure 116: Correct Master Outdoor Unit to Indoor Unit / Heat Recovery Unit Communication Wiring—Daisy Chain Configuration.

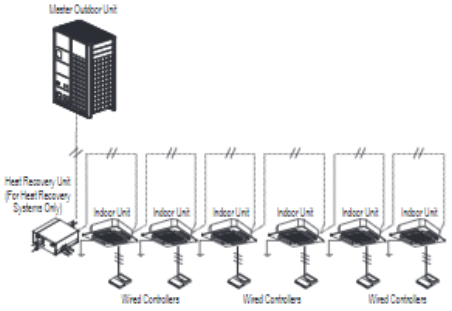


Figure 117: Incorrect Master Outdoor Unit to Indoor Unit / Heat Recovery Unit Communication Wiring—Starburst Configuration.

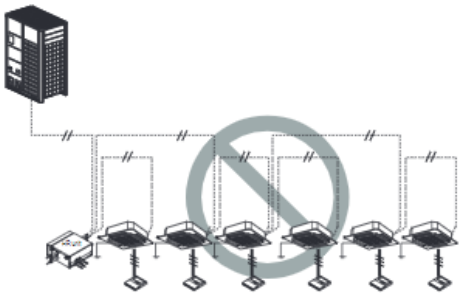


Figure 118: Example of Master Outdoor Unit to Indoor Unit Communication Cable Connections (Heat Pump Systems).

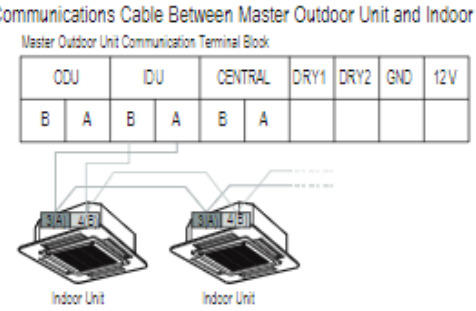
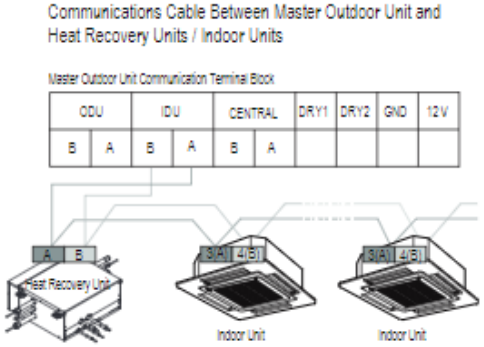


Figure 119: Example of Master Outdoor Unit to Indoor Unit Communication Cable Connections (Heat Recovery Systems).



⚠ WARNING

The terminals labeled "GND" are NOT ground terminals. The terminals labeled ⏚ ARE ground terminals. Inadequate connections will generate heat, cause a fire, and physical injury or death.

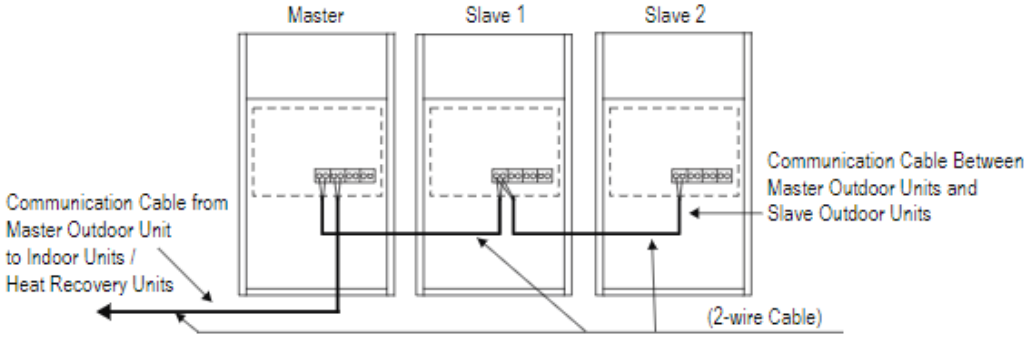
Note:

- *Make sure to match IDU A and B terminals on outdoor unit to A (3) and B (4) terminals on indoor units / heat recovery units. Maintain polarity throughout the communication network. The system will malfunction if not properly wired.*
- *Always create a wiring diagram that contains the exact sequence in which all the indoor units / heat recovery units are wired in relation to the outdoor unit.*
- ⃠ *Do not include splices or wire nuts in the communication cable.*

From Master Outdoor Unit to Slave Outdoor Unit(s), Multi-Frame Systems Only

- Communication cable from Master Outdoor Unit to Slave Outdoor Unit(s) is to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Master ODU chassis only. ⃠ Do not ground the communication cable at any other point. Wiring must comply with all applicable local and national codes.
- Cable shields between the connected devices must be tied together and continuous from the master outdoor unit to the last component connected.
- Master / Slave Communication Bus: Use ODU A and B terminals on master outdoor unit to ODU A and B terminals on slave outdoor unit(s).
- Insulation as required by NEC and local codes.
- Rated for continuous exposure of temperatures up to 140°F.

Figure 120: Communication Cable Installation Between Master Outdoor Unit and Slave Outdoor Unit(s).



ELECTRICAL

Communication Cable Specifications

MULTI V 5 WITH LGRED®

⚠WARNING

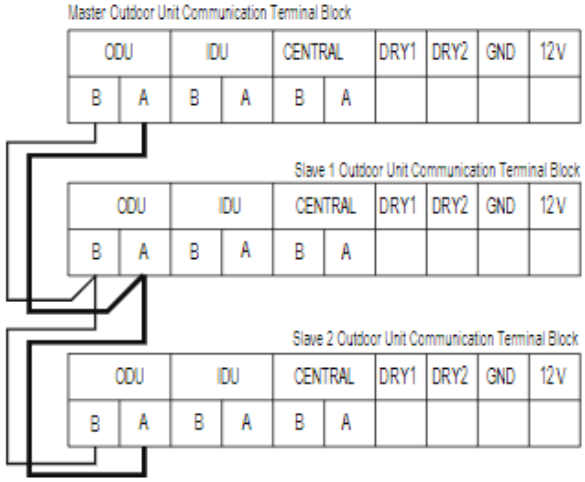
- *Ground wiring is required to prevent accidental electrical shock during current leakage, communication problems from electrical noise, and motor current leakage. ⃠ Do not connect the ground line to the pipes. There is risk of fire, electric shock, explosion, physical injury or death.*
- ⃠ *Never ground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

Note:

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

Figure 121: Close up of Master Outdoor Unit to Slave Outdoor Unit(s) Communication Cable Connections.

Communications Cable Between Master Outdoor Unit and Slave Outdoor Unit(s)



⚠WARNING

The terminals labeled "GND" are NOT ground terminals. The terminals labeled ⏚ ARE ground terminals. Inadequate connections will generate heat, cause a fire, and physical injury or death.

Note:

- *Make sure that the terminals match (A to A, B to B). Maintain polarity throughout the communication network. The system will malfunction if not properly wired.*
- ⃠ *Do not include splices or wire nuts in the communication cable.*

From Master Outdoor Unit to Central Controllers

- Communication cable from Master Outdoor Unit to Central Controller is to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Master ODU chassis only. ⃠ Do not ground the communication cable at any other point. Wiring must comply with all applicable local and national codes.
- Connect all central control devices on the same cable if cable requirements are the same.
- Order does not matter, but polarity does. Keep "A" terminals with "A" terminals, and "B" terminals with "B" terminals. Starting at the outdoor unit, terminate the cable on terminals Internet A and Internet B.
- Route the cable as needed between each device.
- Tie shields together at each termination point.
- Add insulation material as required by local code.

Cable requirements could differ depending on other installed components:

- Communication cable from Master Outdoor Unit to Mode Selector Switch is to be 18 AWG, 3-conductor, twisted or non-twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Master ODU chassis only. ⃠ Do not ground the communication cable at any other point. Wiring must comply with all applicable local and national codes.

From Indoor Units to Remote Controllers

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

Figure 122: One Example of Indoor Unit to Zone Controller Connection.

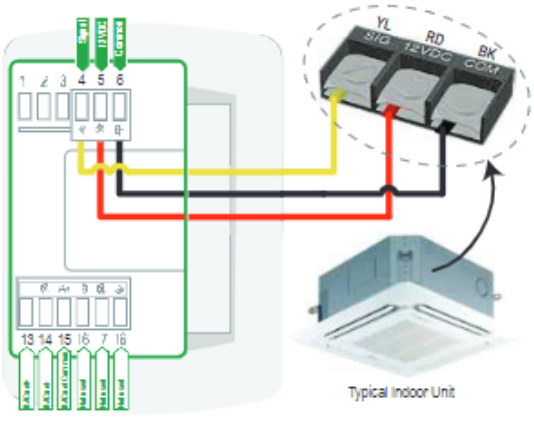
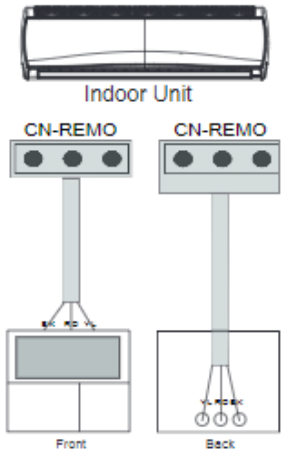


Figure 123: Another Example of Indoor Unit to Zone Controller Connection.



Note:

Cable connected to Zone Controller is the factory default connection.

Between Multiple Indoor Units Operating as a Group (Group Control)

If any indoor units were specified to operate in unison:

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

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

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

For indoor units with CN-REMO connections:

Use Group Control Kit (sold separately) containing extension and Y-splitter cables. Use one (1) group control cable kit for each indoor unit in the group except for the last indoor unit.

Note:

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

Figure 124: Example of Indoor Unit Group to Zone Controller Connections (Sig-12V-GND [Comm.] Terminal).

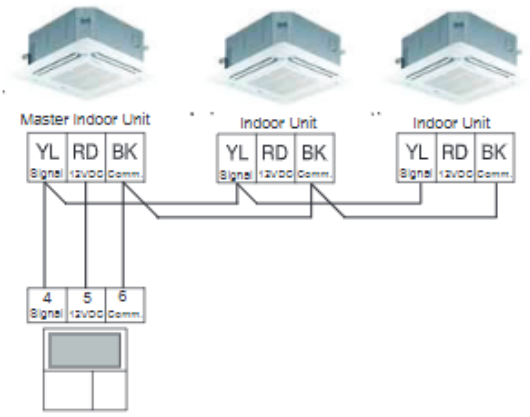


Figure 125: Example of Indoor Unit Group to Zone Controller Connections (CN-REMO).