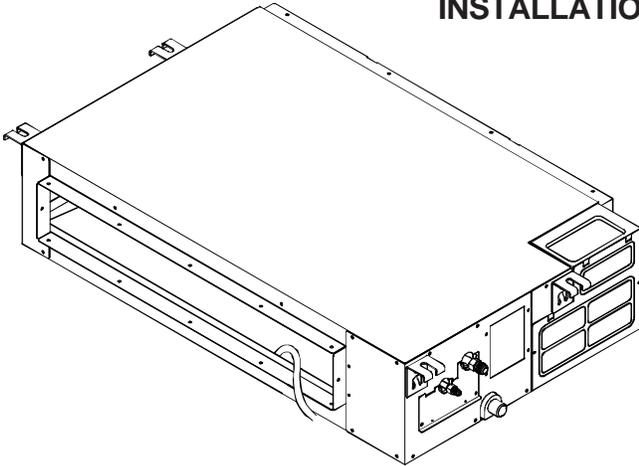


ACNF CEILING MOUNT AIR HANDLER

INSTALLATION INSTRUCTIONS



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Important Safety Instructions

The following symbols and labels are used throughout this manual to indicate immediate or potential safety hazards. It is the owner's and installer's responsibility to read and comply with all safety information and instructions accompanying these symbols. Failure to heed safety information increases the risk of personal injury, property damage, and/or product damage.

Codes & Regulations

This product is designed and manufactured to comply with local, national and international laws, codes and regulations. Installation in accordance with such codes and/or prevailing local codes/regulations is the responsibility of the installer. The manufacturer assumes no responsibility for equipment installed in violation of any codes or regulations.

WARNING

HIGH VOLTAGE!
DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING THIS UNIT. MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH DUE TO ELECTRIC SHOCK. WIRING MUST CONFORM WITH NEC OR CEC AND ALL LOCAL CODES. UNDERSIZED WIRES COULD CAUSE POOR EQUIPMENT PERFORMANCE, EQUIPMENT DAMAGE OR FIRE.



WARNING

GOODMAN WILL NOT BE RESPONSIBLE FOR ANY INJURY OR PROPERTY DAMAGE ARISING FROM IMPROPER SERVICE OR SERVICE PROCEDURES. IF YOU PERFORM SERVICE ON YOUR OWN PRODUCT, YOU ASSUME RESPONSIBILITY FOR ANY PERSONAL INJURY OR PROPERTY DAMAGE WHICH MAY RESULT.


DANGER
PELIGRO



CARBON MONOXIDE POISONING HAZARD

Special Warning for Installation of Furnace or Air Handling Units in Enclosed Areas such as Garages, Utility Rooms or Parking Areas

Carbon monoxide producing devices (such as an automobile, space heater, gas water heater, etc.) should not be operated in enclosed areas such as unventilated garages, utility rooms or parking areas because of the danger of carbon monoxide (CO) poisoning resulting from the exhaust emissions. If a furnace or air handler is installed in an enclosed area such as a garage, utility room or parking area and a carbon monoxide producing device is operated therein, there must be adequate, direct outside ventilation.

This ventilation is necessary to avoid the danger of CO poisoning which can occur if a carbon monoxide producing device continues to operate in the enclosed area. Carbon monoxide emissions can be (re)circulated throughout the structure if the furnace or air handler is operating in any mode.

CO can cause serious illness including permanent brain damage or death.

B10259-216

WARNING

TO PREVENT THE RISK OF PROPERTY DAMAGE, PERSONAL INJURY, OR DEATH, DO NOT STORE COMBUSTIBLE MATERIALS OR USE GASOLINE OR OTHER FLAMMABLE LIQUIDS OR VAPORS IN THE VICINITY OF THIS APPLIANCE.



WARNING

Do not connect to or use any device that is not design certified by Goodman for use with this unit. Serious property damage, personal injury, reduced unit performance and/OR hazardous conditions may result from the use of such non-approved devices.

CAUTION

Have your contractor identify all the various cutoff switches and devices that service this unit. Know where the switch is that will cut off energy to the heating system in the event of overheating.

Special Notes for European Consumers:

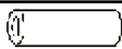
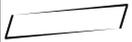
Do not dispose of this product as unsorted municipal waste. Collection of such waste for special treatment is necessary. It is strictly prohibited to dispose of this unit in domestic household waste. Disposal options:

1. Some municipalities have established collection systems to collect electronic waste for disposal.
2. Your purchase point retailer (or manufacturer) may take back the unit for disposal.
3. Used products contain valuable resources and can be sold to scrap metal dealers.

Illegal disposal in forests and landscapes endanger your health and the environment. Hazardous materials leak into ground water.

SHIPPING INSPECTION

Upon receiving the product, inspect it for damage from shipment. Shipping damage, and subsequent investigation is the responsibility of the carrier. Verify the model number, specifications, electrical characteristics, and accessories are correct prior to installation. The distributor or manufacturer will not accept claims from dealers for transportation damage or installation of incorrectly shipped units.

	Name	Shape	Qty.
Tubes & Fittings	Soundproof/Insulation sheath		2
	Binding Tape		1
	Seal Sponge		1
	*Orifice		1
Drain Pipe Fittings for cooling/heating	Drain joint		1
	Seal ring		1
Wire controller	Wire controller	---	1
Literature	Owner's Manual	---	1
	Installation Manual	---	1

* As applicable

APPLICATION INFORMATION

This ceiling mount air handler is available in cooling capacities of 1.0, 1.5, 2, 2.5, 3.0, 3.5, 4.0 and 6.0 nominal tons of cooling. Electric heat models are available in capacities of 0, 5, 6, 8 and 10 kW.

The unit is designed to be installed in a horizontal position above a dropped ceiling. **Do NOT install this unit outside the structure. These models are designed for INDOOR USE ONLY.**

PRE-INSTALLATION CONSIDERATIONS

Carefully read all instructions for the installation prior to installing product. Make sure each step or procedure is understood and any special considerations are taken into account before starting installation. Assemble all tools, hardware and supplies needed to complete the installation. Some items may need to be purchased locally. Make sure everything needed to install the product is on hand before starting.

Before attempting any installation, the following points should be considered:

- Structural strength of supporting members
- Clearances and provision for servicing
- Power supply and wiring - Routing of wires must be arranged so the control board cover is fixed properly. If not, a possibility of overheating, fire or electrical shock may occur at the connection point of the terminal.
- Air duct connections - Ductwork should be fabricated in accordance with local codes and sized to accommodate 375-425 CFM per ton of cooling with the static pressure not to exceed 0.5" W.C. Inadequate ductwork that restricts airflow can result in improper performance and compressor or heater failure.
- Drain facilities and connections
- Installation of unit must be, at a minimum, of 91" (2.3m) above the floor.
- Electrical installations must be in accordance with local national wiring standards, regulations and this installation instruction. An independent circuit and single outlet must be used. If installed without the proper electrical circuit capacity, or installed defectively, possibility of electrical shock or fire may occur.
- To ensure proper performance of unit, use the specified cable, and clamp the cable securely to prevent disconnection as this will cause overheating or fire at the connection.
- An all-pole disconnect switch, having a contact separation of at least 3mm in all poles, should be connected in the fixed wiring.

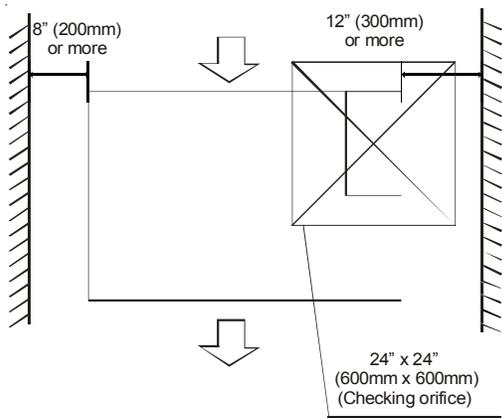


Figure 1 - Room clearances

NOTE: To prevent interference, keep indoor unit, outdoor unit, power supply wiring and transmission wiring at least 39" (1 meter) from televisions and radios.

INSTALLATION ORDER

Install your unit in the following order:

1. Select the mounting locations.
2. Install the indoor unit.
3. Install the outdoor unit.
4. Install the connecting pipe
5. Connect the drain pipe.
6. Wiring.
7. Test operation.

LAYOUT FOR CEILING MOUNT AIR HANDLERS

NOTE: The location of the unit is based on thorough consideration of the PRE-INSTALLATION CHECK POINTS below:

- Structural strength of supporting members
- Clearances and provision for servicing
- Power supply and wiring
- Air duct connections
- Drain facilities and connections

1. Before locating the unit on the dropped ceiling, ensure the strength of the ceiling and beams is adequate to support the weight involved. This is an important step and the installers responsibility.

Installing the four (4) 3/8" (Ø 10) Hanging Screw Bolts

2. Mount the unit in a horizontal position above a dropped ceiling of adequate strength with four 3/8" (Ø 10) hanging screw bolts. Refer to the following figures for distance between the screw bolts.

3. The installation to ceilings varies with construction. Consult construction personnel for the specific procedures.
4. Install pipes and lines in the ceiling after completion of the installation of the ACNF air handler. The first consideration of installation is to determine the direction of the pipes. When installing in a ceiling, position the refrigerant pipes, drain pipes, indoor and outdoor lines to the connections before hanging the unit.
5. Install the hanging screw bolts.
6. After the selection of installation location, position the refrigerant pipes, drain pipes, indoor and outdoor lines to the connections before hanging the unit.
7. Attach the hanging screw bolts.

NOTE: The minimum drain tilt is at least 1/100.

Wooden construction

Put the square timber transversely over the roof beam, then install the hanging screw bolts.

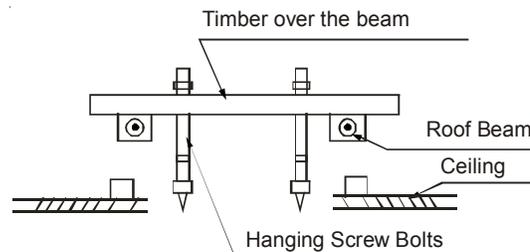


Figure 2

New Concrete or Bricks

Embedding the screw bolts, Figure 3.

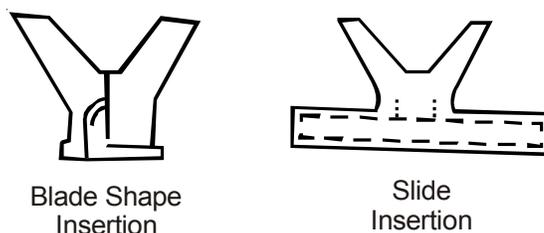
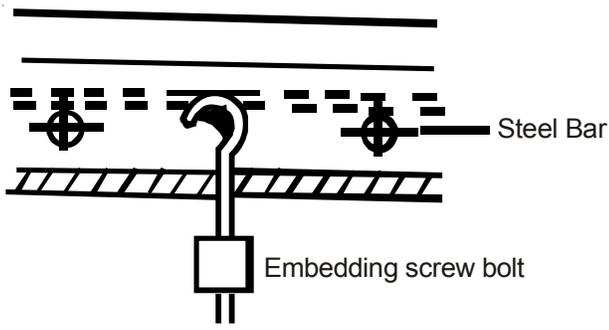


Figure 3

Installation for Existing Concrete Bricks

Use embedding screw bolt, crock and stick harness as shown in Figure 4.



(Pipe hanging & embedding screw bolt)

Figure 4

Steel Room Beam Structure

Install directly on the supporting angle steel. See Figure 5.

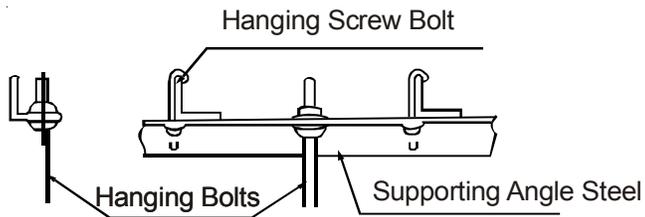


Figure 5

Hanging the Indoor Unit

1. Place the indoor unit onto the hanging screw bolts with block.
2. Using a level, position the unit to hang flat to prevent leaks, Figure 6.

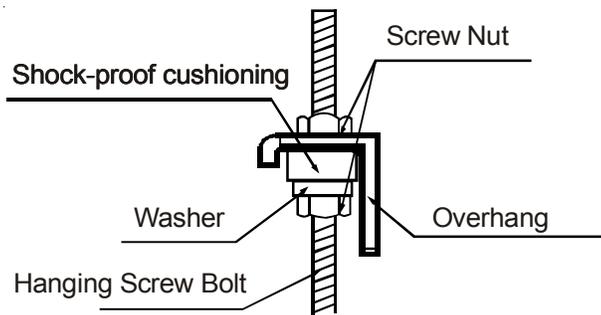


Figure 6

Installing the dust proof net and canvas air passage

1. Install the dust proof net according to the installation manual.
2. Install the canvas air passage underneath the dust proof net.

Duct Design

1. Air inlet/outlet ducts must be spaced to prevent air from the outlet from entering the air inlet.

2. A dust filter is located on the indoor unit.

Recommended duct connections:

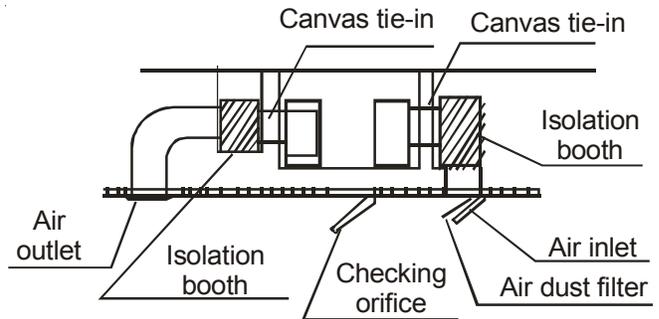


Figure 7

3. It is important to maintain the static pressure below to alleviate excessive noise, blowing water or other abnormalities.

Model (Kw)	Static Pressure Inches H ₂ O (Pa)
12	0.16 (40)
18	0.28 (70)
24	0.28 (70)
30-36	0.32 (80)
42-60	0.40 (100)

NOTES:

1. The indoor unit should not bear the connecting duct's weight.
2. Use the fire retardant canvas tie-in to prevent vibrating.
3. When connecting the ductwork, install in a location where maintenance can be done easily.
4. The fan motor static pressure should correspond to the external static pressure.
5. When installed in a noise-sensitive setting, install an isolation booth and internal duct underlayer to help muffle the duct noise. (Figure 7.)

Positioning the ceiling hole, indoor unit and hanging screw bolts.

See table below for dimensions.

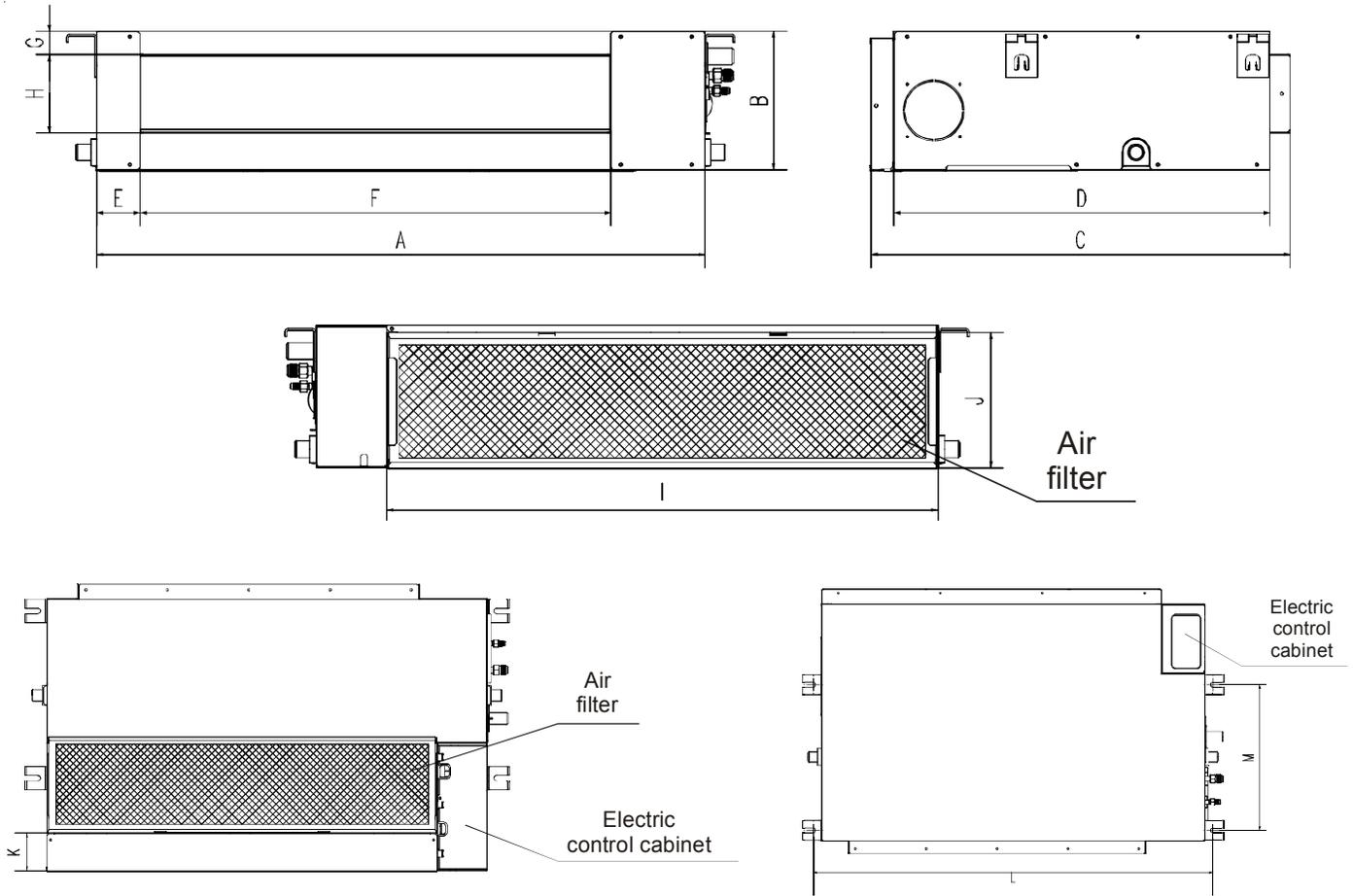


Figure 8

	Outline dimension				Air outlet opening size				Air return opening size			Size of mounted lug	
	A	B	C	D	E	F	G	H	I	J	K	L	M
12	27 1/2" 700mm	8" 210mm	25" 635mm	22 1/4" 570mm	2 1/2" 65mm	19 1/4" 493mm	1 1/4" 35mm	4 3/4" 119mm	23 1/4" 595mm	8" 200mm	3" 80mm	29" 740mm	13 3/4" 350mm
12, 18	36" 920mm	8" 210mm	25" 635mm	22 1/4" 570mm	2 1/2" 65mm	28" 713mm	1 1/4" 35mm	4 3/4" 119mm	32" 815mm	8" 200mm	3" 80mm	37 3/4" 960mm	13 3/4" 350mm
24	45" 1140mm	8" 210mm	25" 635mm	22 1/4" 570mm	2 1/2" 65mm	36 3/4" 933mm	1 1/4" 35mm	4 3/4" 119mm	40 3/4" 1035mm	8" 200mm	3" 80mm	46 1/2" 1180mm	13 3/4" 350mm
	36" 920mm	10 1/2" 270mm	25" 635mm	22 1/4" 570mm	2 1/2" 65mm	28" 713mm	1 1/4" 35mm	7" 179mm	32" 815mm	10" 260mm	3/4" 20mm	37 3/4" 960mm	13 3/4" 350mm
30-36	45" 1140mm	10 1/2" 270mm	30 1/2" 775mm	28" 710mm	2 1/2" 65mm	36 3/4" 933mm	1 1/4" 35mm	7" 179mm	40 3/4" 1035mm	10" 260mm	3/4" 20mm	46 1/2" 1180mm	19 1/4" 490mm
42-60	47" 1200mm	11 3/4" 300mm	34" 865mm	31 1/2" 800mm	31" 80mm	38" 968mm	1 1/2" 40mm	8" 204mm	43" 1094mm	11 1/4" 288mm	1 3/4" 45mm	48 3/4" 1240mm	19 3/4" 500mm

Adjusting the airflow direction

1. Remove the ventilation panel and flange; cut off the staples at the side rail.

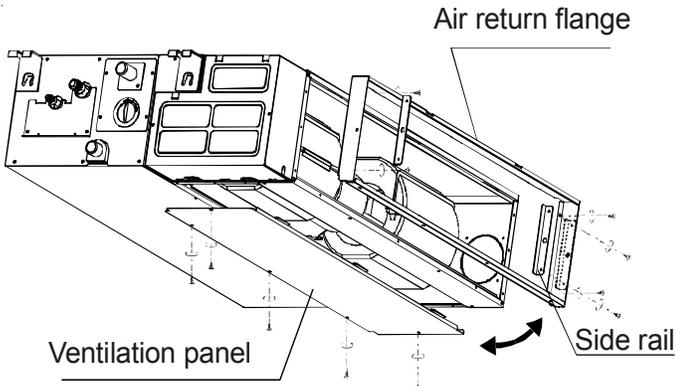


Figure 9

2. Attach the seal sponge as shown below. Change the mounting positions of the air return panel and air return flange.

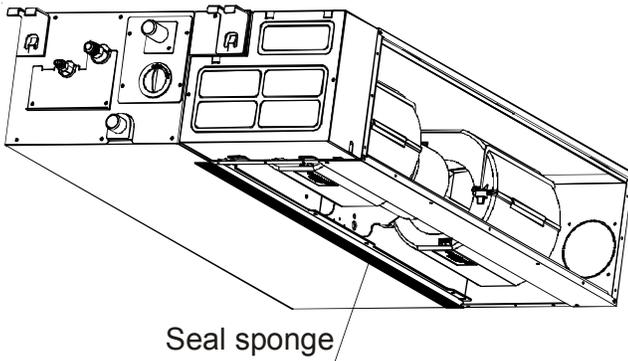


Figure 10

3. When installing the filter mesh, place the filter mesh in the flange and push up to set it in place, as shown by the arrows in the following Figure 11.

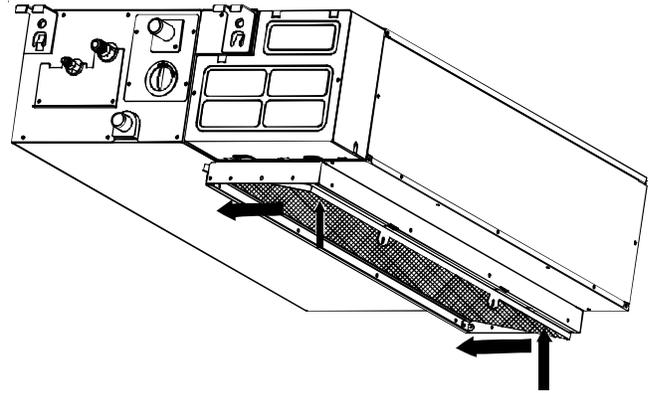


Figure 11

4. Insert the clips in the flange holes as shown in Figure 12.

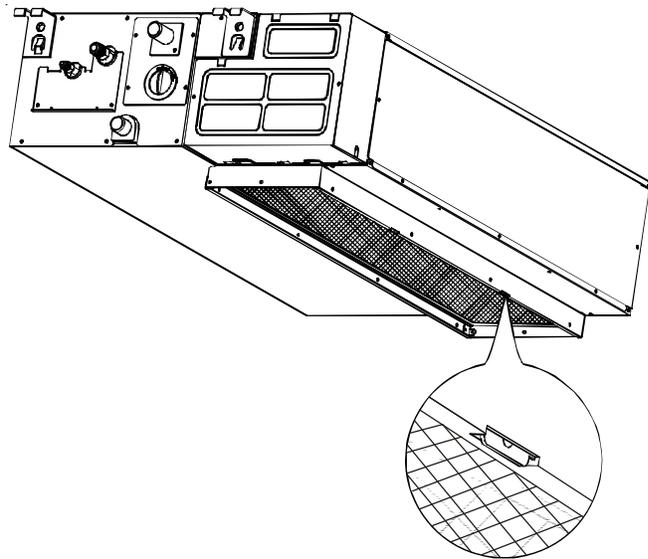
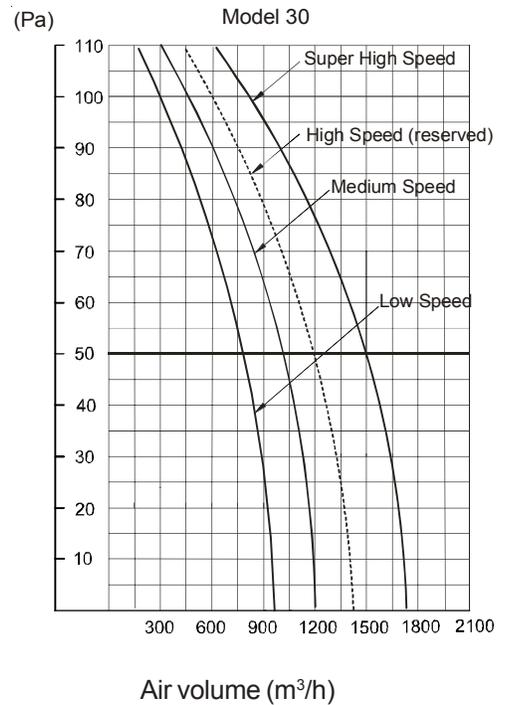
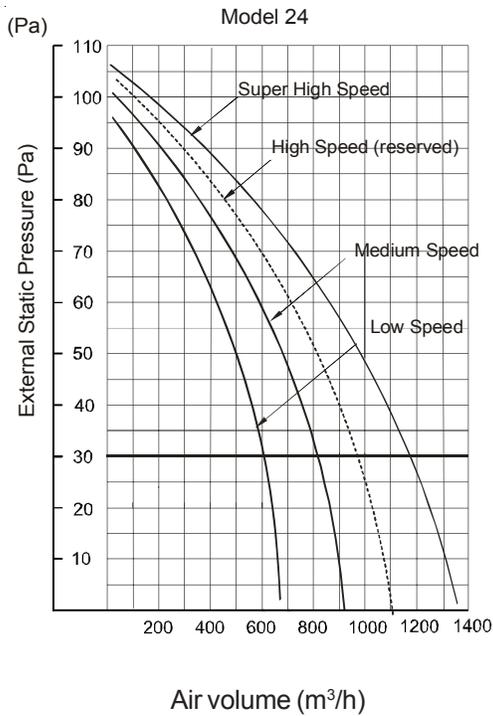
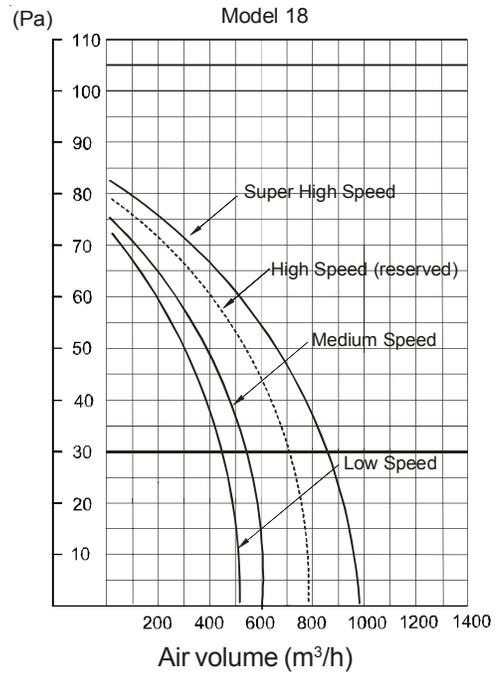
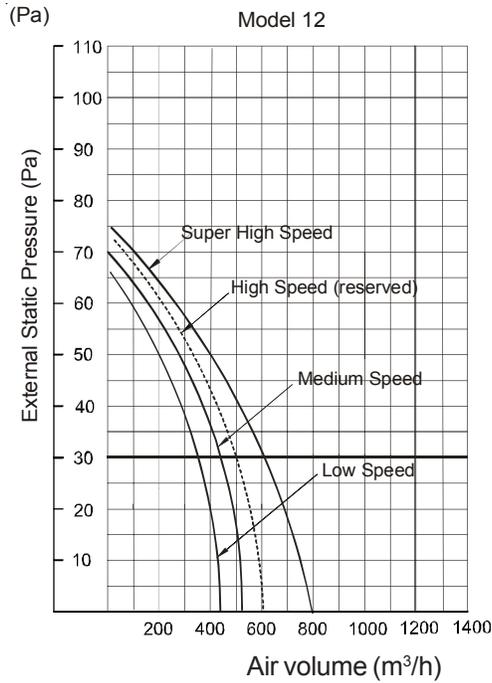


Figure 12

Fan Performance - Static Pressure Curve

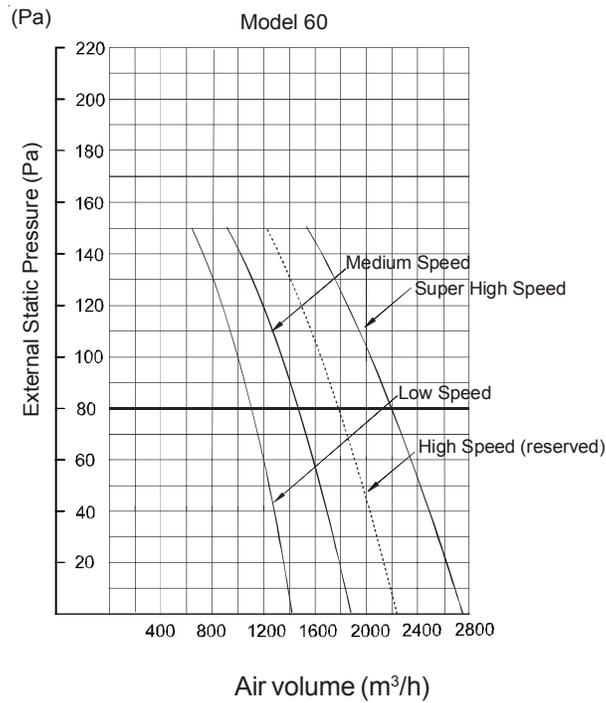
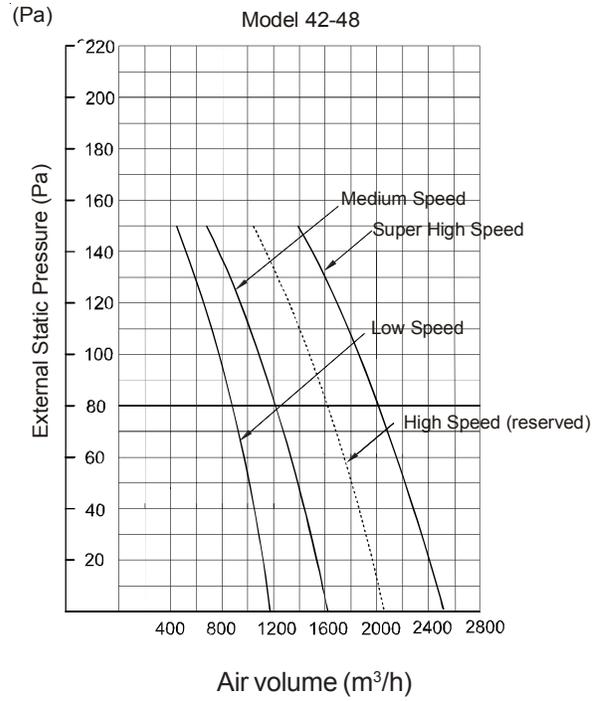
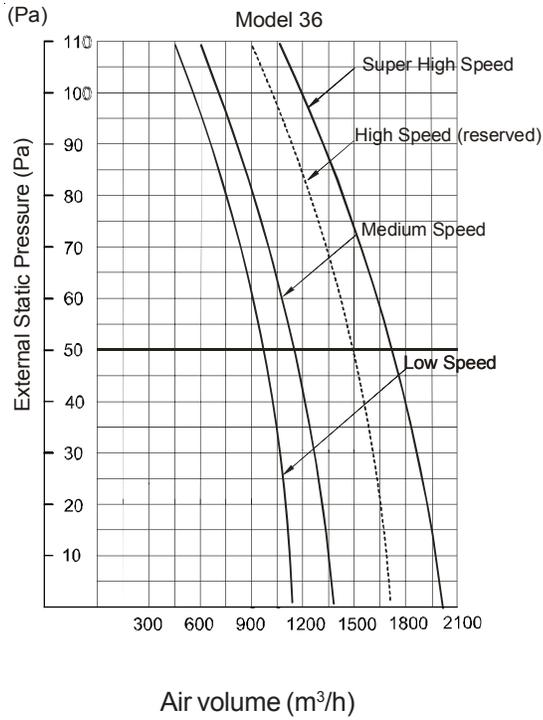


NOTE:

1 m³/hr = 0.586 CFM

100 Pa = 0.4015 Inches of water

Fan Performance - Static Pressure Curve



NOTE:
 1 m³/hr = 0.586 CFM
 100 Pa = 0.4015 Inches of water

OUTDOOR UNIT INSTALLATION

The following are considerations before installing the outdoor unit.

- Install the outdoor unit on a rigid base to prevent noise and vibration.
- Place the outdoor unit in such a manner to minimize restriction of discharge air.
- Protect the unit from prevailing winds. To ensure the unit operates correctly, place the unit lengthwise along a wall or use a dust or shield plate.

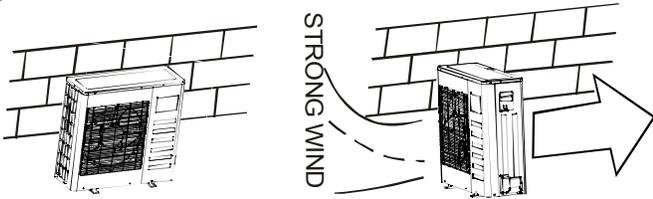


Figure 13A

Figure 13B

- Install in a place where the unit is easily accessible for installation and maintenance.

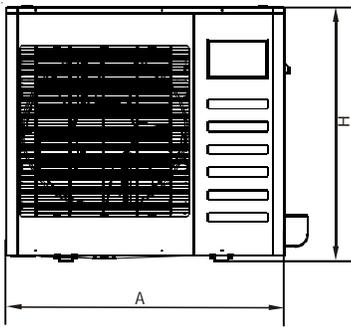


Figure 14A

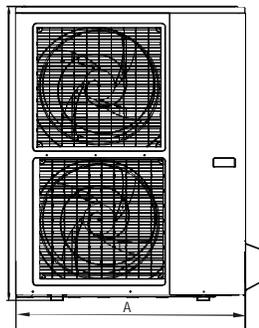


Figure 14B

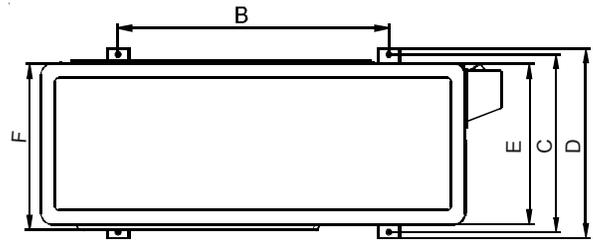


Figure 14C

- See Figure 15 for minimum distances to obstacles. Two of the three must remain unobstructed.

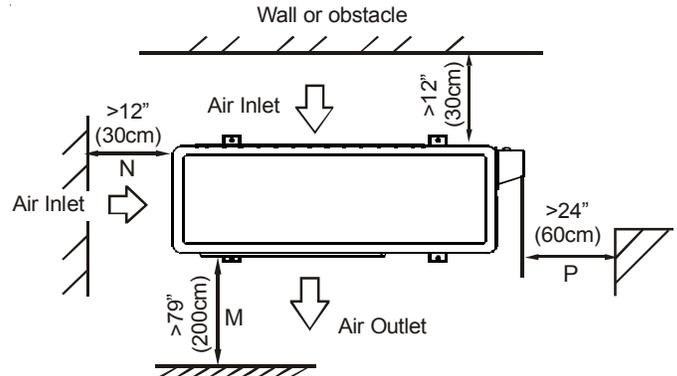


Figure 15

Moving and Installation

Notes:

- The inlet of the unit should not be used as a “handle” when moving the unit.
- Use caution when moving the unit with a sling, since the center of gravity is not in the unit’s physical center.
- The fan should not be touched with hands or any foreign objects.
- Do not lean the unit more than 45° or lay it on its side.

Model	A	B	C	D	E	F	H	Figure Ref.
12,000 R-22 & R-410A	31" 780mm	21 1/2" 548mm	10 1/2" 266mm	11 1/2" 300mm	9 1/2" 241mm	9 1/2" 250mm	21 1/2" 547mm	Figure 14A
18,000 R-22 & R-410A	30" 762mm	21" 530mm	11" 290mm	12" 315mm	10 1/2" 270mm	11" 282mm	23" 593mm	
24,000 R-22 & R-410A	33" 842mm	22" 560mm	13" 335mm	14" 360mm	12" 312mm	12 1/2" 324mm	27" 695mm	
30,000/36,000 R-22 & R-410A	39" 990mm	24 1/5" 624mm	14" 366mm	15 1/2" 396mm	13" 340mm	13 3/4" 354mm	38" 966mm	
48,000 R-22 Only	39" 990mm	24 1/5" 624mm	14" 366mm	15 1/2" 396mm	13" 340mm	13 3/4" 354mm	38" 966mm	
48,000 R-410A Only	35" 900mm	23" 590mm	14 3/4" 378mm	15 1/2" 400mm	13" 330mm	13 1/4" 340mm	45 3/4" 1167mm	Figure 14B
60,000 R-22 & R-410A	35" 900mm	23" 590mm	14 3/4" 378mm	15 1/2" 400mm	13" 330mm	13 1/4" 340mm	45 3/4" 1167mm	Figure 14B

- See Figure 16 for securing the outdoor unit horizontally to a concrete foundation. Fasten the feet of the outside unit securely with bolt to prevent movement of the unit in adverse weather conditions, such as high winds or earthquake.

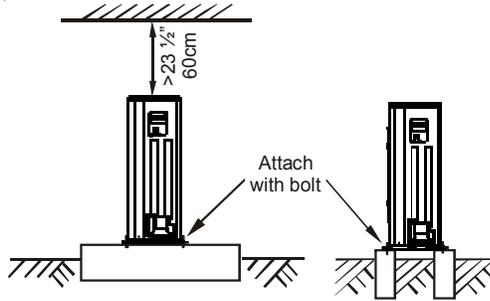


Figure 16

INSTALLING THE CONNECTING PIPE

The following chart lists the proper height drop between the indoor unit and outdoor, the length of refrigerant pipe and the number of bends.

R-22

Model	Refrigerant Pipe Length	Maxium Height Drop
12	49' (15 m)	26' (8 m)
18/24	98' (30 m)	33' (10 m)
30-42	164' (50 m)	66' (20)
48-60	164' (50 m)	82' (25 m)

Unit in feet & meters

R-410A

Model	Refrigerant Pipe Length	Maxium Height Drop
12	49' (15 m)	26' (8 m)
18/24	82' (25 m)	49' (15 m)
30/36	98' (30 m)	66' (20)
48	98' (30 m)	66' (20)
60	98' (30 m)	66' (20)

Unit in feet & meters

The outdoor unit is factory charged with refrigerant. Some systems require additional charging of refrigerant depending upon pipe length. The additional charge can be calculated with the following formula:

D(mm)	R(g)		
	1/4" (Ø 6.4)	3/8" Ø9.5	1/2" Ø12.7
L(m)			
Less than 16 1/2' (5m) (one way)	---	---	---
Added Refrigerant when over 16 1/2' (5m) (one way)	2.6 in/lb x (L-5) 30g/m x (L-5)	5.6 in/lb x (L-5) 65g/m x (L-5)	10.0 in/lb x (L-5) 115g/m x (L-5)

NOTES:

- Avoid letting air, dust or other impurities get into the pipe system during installation.
- The connecting pipe should not be installed until the indoor and outdoor units are installed. The connecting pipe should be kept dry during the installation operation.
- If additional refrigerant is added, record the amount and retain a copy for future maintenance.

Connection of piping

All field piping must be provided by a licensed refrigeration technician and must comply with the applicable local and national codes.

- Measure the necessary length of the connecting pipe, following the instructions below. Connect the indoor unit first and then the outdoor unit.

- Carefully bend the tubing as shown below.

Bend the pipe with the thumbs



Minimum radius - 4" (100mm)

Figure 17

- Daub the surfaces of the flare pipe and the joint nuts with refrigeration oil. Rotate it 3 to 4 rounds with your hands before fastening the flare nuts.

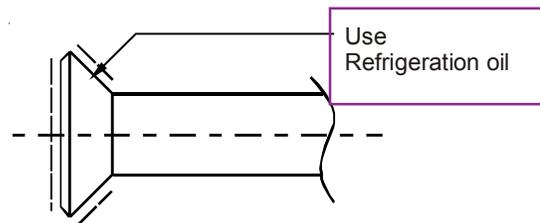


Figure 18

- Always use two (2) wrenches simultaneously when you connect or disconnect the pipes.

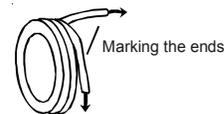


Figure 19

- Make sure the stop valve of the outdoor unit is closed completely. When loosening it for connecting, first loosen the nuts on the stop valve. Connect the flare pipe immediately (within 5 minutes) to prevent dust and debris from contaminating the system. Always expel the air from the pipes with refrigerant before connection.

- Expel the air after connecting the refrigerant pipe with the indoor and outdoor units. Fasten nuts at the repair points.
- Bend the connecting pipe of small wall thickness.

Cut out a desired concave at the bending part of the insulating pipe. Cover exposed portions of the pipe with tape after bending to prevent impurities from entering.

Bend the connecting pipe of small wall thickness.

Cut out a desired concave at the bending part of the insulating pipe.

To prevent collapsing or deforming, bend the pipe at its biggest radius.

Use a bender to get small radius pipes.

NOTES: The bending angle should not exceed 90°

The middle of the pipe is the best place to bend, since a large bending radius is preferable.

Pipes should not be bent more than three times.

Be sure to use the same insulating materials when you buy brass pipe (more than 9mm thick).

Installing the pipe

1. Drill a hole in the wall to accommodate the wall conduit. Install the fittings such as the wall conduit and its cover.
2. Bind the connecting pipe and the cables together tightly with binding tape.
3. Pass the bound connecting pipe through the all conduit from the outside, being careful not to damage the tubing.
4. Connect the pipes (see Connection of Piping).
5. Expel the air with a vacuum pump.
6. Open the stop valves of the outdoor unit to make the refrigerant pipe connecting the indoor unit with the outdoor unit flow sufficiently.
7. Check for leakage, checking all joints with the leak detector or soapy water.
8. Cover the joints of the connecting pipe with the sound-proof / insulating sheath (fittings) and bind it well with tape to prevent leaking.

REFRIGERANT PIPE CONNECTION

Expelling the air

Flaring:

1. Cut the pipe with a pipe cutter. See Figure 20A for correct alignment.

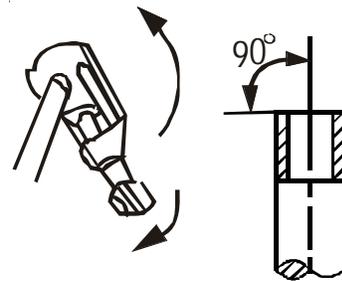


Figure 20A

Incorrect alignment is show below, Figure 20B.

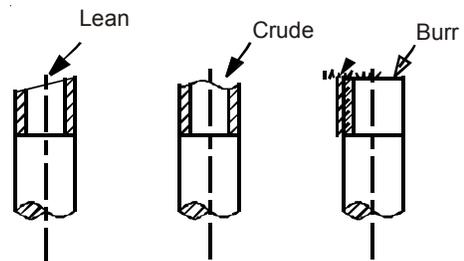


Figure 20B

2. Insert a flare nut into a pipe and flare the pipe.

Fasten the nut

1. Align the center of the pipes and finger-tighten the flare nut. Using a spanner and torque wrench (Figure 21), continue tightening the flare nut until the nut is firmly on the pipe.

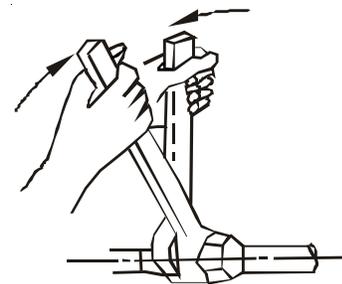


Figure 21



CAUTION

Do not over-tighten. Excessive torque can break the nut and/or crimp the pipe.

See the following table to determine torque ranges.

Pipe Gauge	Tightening Torque	Flare Dimension A		Flare Shape
		Min	Max	
1/4" (Ø 6.4)	10.5~12.7 ft/lbs (124.9~152.7 lb/in) 14.2~17.2 N.m (144~176 kgf.cm)	5/16" 8.3	11/32" 8.7	
3/8" Ø9.5	24.1~29.4 ft/lbs (289.0~353.2 lb/in) 32.7~39.9 N.m (333~407 kgf.cm)	15/32" 12.0	1/2" 12.4	
1/2" Ø12.7	36.5~44.6 ft/lbs (437.4~534.6 lb/in) 49.5~60.3 N.m (504~616 kgf.cm)	19/32" 15.4	5/8" 15.8	
5/8" Ø15.9	45.6~55.6 ft/lbs (546.8~668.3 lb/in) 61.8~75.4 N.m (630~770 kgf.cm)	23/32" 18.6	3/4" 19.0	
3/4" Ø19.1	71.7~87.5 ft/lbs (859.2~1050 lb/in) 97.2~118.6 N.m (990~1210 kgf.cm)	29/32" 22.9	29/32" 23.3	

COOLING & HEATING: Correct installation, Figure 23.

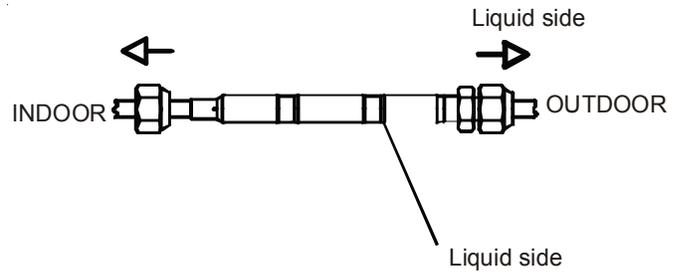


Figure 23

COOLING & HEATING: Do not install as shown in Figure 24.



Figure 24

Leak Testing (Nitrogen or Nitrogen-Traced)

Pressure test the system, using dry nitrogen and soapy water to locate any leaks in the system. If you wish to use a leak detector, charge the system to 10 psi using the appropriate refrigerant, then use nitrogen to finish charging the system to working pressure. Apply the detector to suspect areas. If leaks are found, repair them. After repair, repeat the pressure test. If no leaks exist, proceed to System Evacuation.

Insulation

Cover all exposed parts of the flare pipe joints and refrigerant pipe on both the liquid and gas sides, with insulating materials. Incomplete coverage may cause water condensation.

CONNECTING THE AIR HANDLER TO THE OUTDOOR UNIT

To receive optimum throttle efficiency, mount the orifice as level horizontally as possible. Anti-shock rubber should be wrapped on the external parts of the orifice to reduce noise.

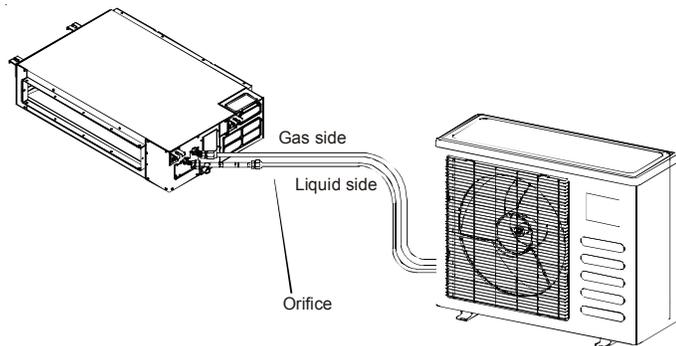


Figure 22

1. Mark the data plate with the orifice installed.
2. Purchase the fittings according to the requirements in the manuals.
3. Refer to the diagrams for reference while installing.

CONNECTING THE DRAIN PIPE - INDOOR UNIT

Purchased from your dealer, polyethylene tubing can be used as the drain pipe (outside diameter 1" - 1/10" (29-31mm); (inside diameter 1" or 25mm).

To prevent water from ingressing into the air conditioner when the air conditioner is not operating, the drain pipe should be slanted down toward the outdoor (outlet side) at a degree of over 1/50. Avoid any bulges or water deposits.

Take care not to put undue stress on the drain pipe when connecting to prevent its pulling away from the body. One support point should be set every 39" - 59" (1-1.5m) to help support the drain pipe and prevent it from pulling. The drain pipe can also be tied to the connecting pipe for support.

If the drain pipe is long, tighten the indoor part with a sealant to prevent its loosening.

If the drain pipe's outlet is higher than the body's pump joint, arrange the pipe as vertically as possible, with the left distance less than 8" (200mm). Otherwise, the water will overflow when the air conditioner ceases operation. *Only available with units with plugs.*

The end of the drain pipe should be over 2" (50mm) higher than the ground or the bottom of the drainage chute. Do not immerse it in water. If water is discharge directly into sewage, make a U-form aqua seal by bending the pipe up to prevent odorous gases from entering the home through the drain pipe.

Drain Pipe Installation for the unit with pump: Figure 25.

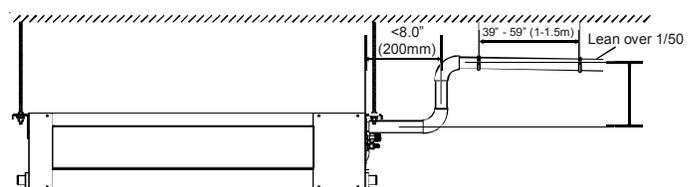


Figure 25

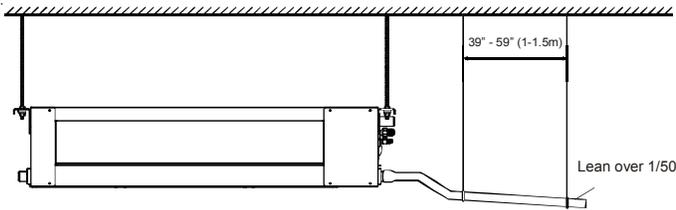


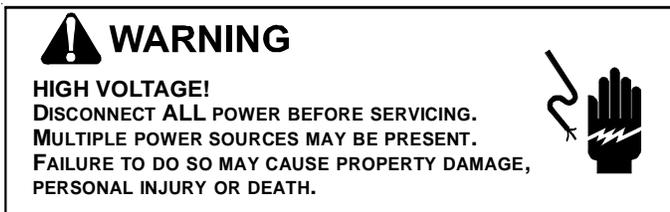
Figure 26

Drainage Test

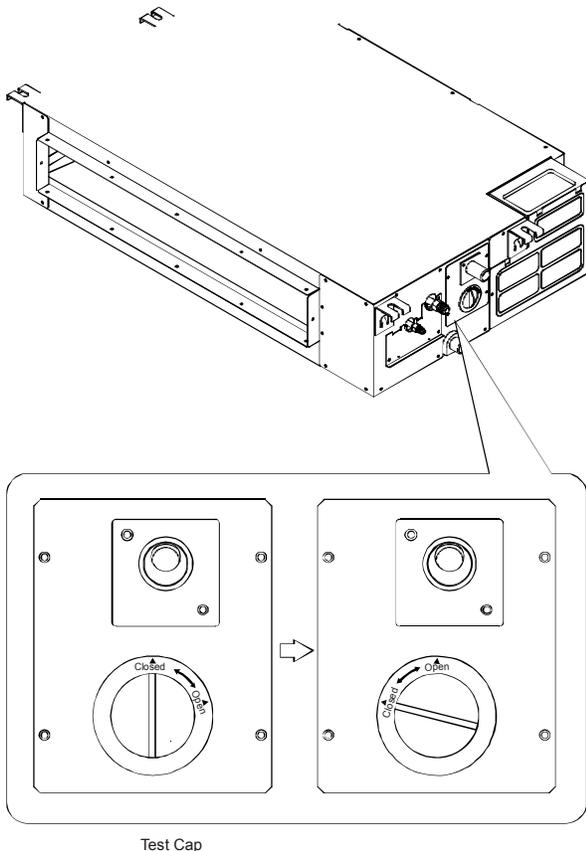
Make sure drain pipe is draining properly. Recently constructed homes should have this tested before finishing the ceiling.

UNITS WITH PUMPS:

1. Turn power off.



2. Remove the test cap cover by rotating the cover to the "open" position (Figure 27). Slowly run approximately 4 US pints (2000ml) of water to the water receiver through the stow tube. See Figure 28



Test Cap

Figure 27

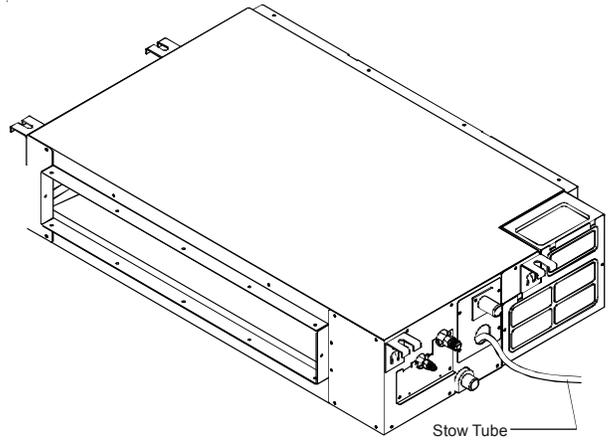


Figure 28

3. Restore power to the unit and operate the air conditioner under the COOLING mode. While listening to the sound of the drain pump, check to see if the water is discharge properly.

NOTE: According to the length of the drain pipe, there is an approximate one minute wait time before the water begins discharging. Check joints to see if there is leaking.

4. Stop the air conditioner. Turn off power and reset the test cover to it original position.
5. Remove the test cover and add approximately 4 US pints (2000ml) of water to the water received through the side stow tube to see if the water is draining properly through the drain pipe. See Figure 29.

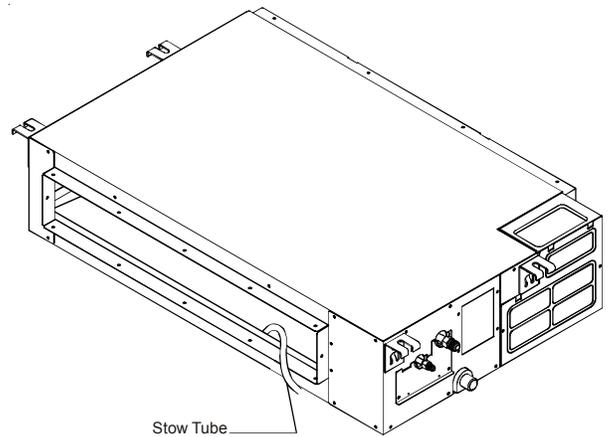


Figure 29

Installing the drain joint of the outdoor unit

1. Fit the seal in to the drain joint. Insert the drain joint into the base pan hole of the outdoor unit. Rotate 90°.
2. Connect the drain joint with an extension drain hose (installer purchased). This procedure will drain any condensate that may be produced during the HEATING mode.

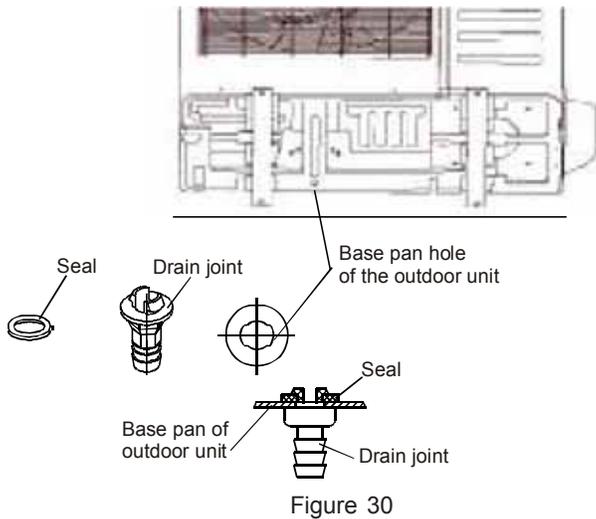


Figure 30

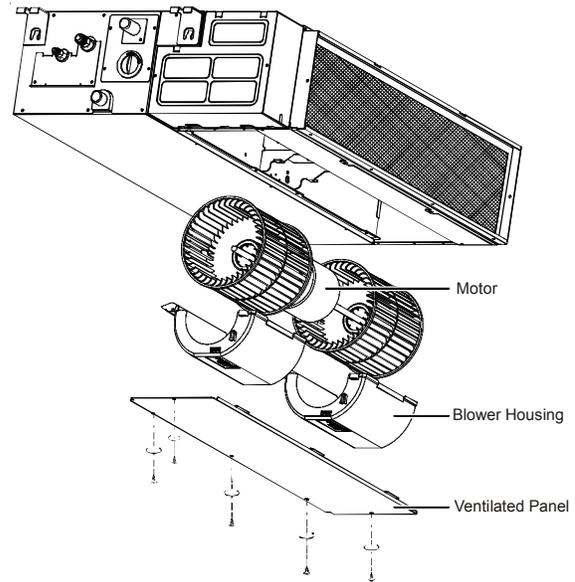


Figure 32

UNITS WITH FRESH AIR DUCT INSTALLATION

For unit's having a fresh air duct, see Figure 31 below for dimensions.

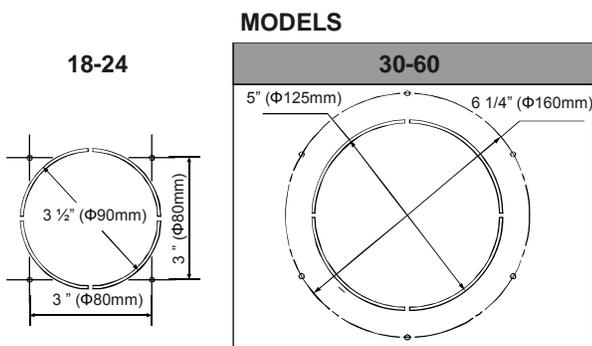
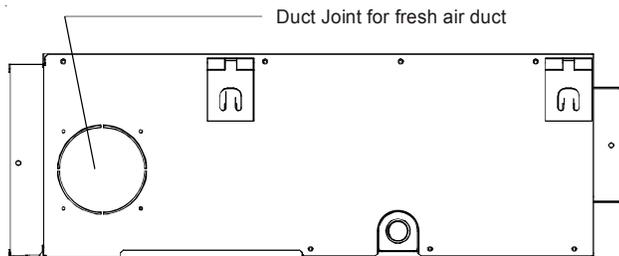


Figure 31

PUMP MAINTENANCE

1. Remove the four screws from the drain pump. See Figure 33.
2. Plug off pump power supply and water level switch cable.
3. Remove pump.

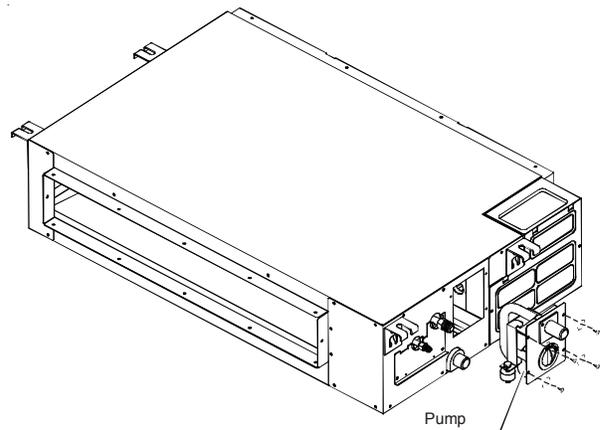


Figure 33

MOTOR AND DRAIN PUMP MAINTENANCE

Example shown is rear ventilated.

MOTOR MAINTENANCE

1. Remove the ventilated panel.
2. Remove half of the motor housing and remove motor, as shown in Figure 32.

WIRING

IMPORTANT NOTES:

1. This unit is to be installed in accordance with national and local wiring regulations.
2. Install unit with a separate power supply with rated voltage.
3. The external power supply to the air conditioner requires ground wiring, which is linked to the ground wiring of the indoor and outdoor units.
4. Wiring should be done by qualified persons and according to the wiring and circuit drawings.



WARNING

INSTALLATION AND REPAIR OF THIS UNIT SHOULD BE PERFORMED ONLY BY INDIVIDUALS MEETING THE REQUIREMENTS OF AN "ENTRY LEVEL TECHNICIAN" AS SPECIFIED BY THE AIR-CONDITIONING, HEATING, AND REFRIGERATION INSTITUTE (AHRI). ATTEMPTING TO INSTALL OR REPAIR THIS UNIT WITHOUT SUCH BACKGROUND MAY RESULT IN PRODUCT DAMAGE, PERSONAL INJURY OR DEATH.



WARNING

GOODMAN WILL NOT BE RESPONSIBLE FOR ANY INJURY OR PROPERTY DAMAGE ARISING FROM IMPROPER SERVICE OR SERVICE PROCEDURES. IF YOU PERFORM SERVICE ON YOUR OWN PRODUCT, YOU ASSUME RESPONSIBILITY FOR ANY PERSONAL INJURY OR PROPERTY DAMAGE WHICH MAY RESULT.

5. An all-pole disconnection device with at least 3mm separation distance in all poles and a residual current device (RCD) with a rating above 10mA should be incorporated in the fixed wiring, according to national codes.
6. Located the power wiring and signal wiring so there is no cross disturbance.
7. Check wiring carefully before turning on power.
8. Power cord type designation is H07RN-F.

As per EMC Directive 2004/108/EC:

To prevent flicker impressions during the start of the compressor (technical process), the following installation conditions apply:

1. The power connection for the air conditioner has to be done at the main power distribution. The distribution has to be of a low impedance. Normally, the required impedance reaches at a 32A fusing point.
2. No other equipment has to be connected with this power line.
3. For detailed installation acceptance, please refer to your power supplier, if restrictions do apply for products like washing machines, air conditioners or electrical ovens.
4. For power details of the air conditioner, refer to the rating plate of the product.
5. For any questions, contact your local dealer.

Connecting the cable



WARNING

HIGH VOLTAGE!
DISCONNECT ALL POWER BEFORE SERVICING.
MULTIPLE POWER SOURCES MAY BE PRESENT.
FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE,
PERSONAL INJURY OR DEATH.



1. Remove the bolts from the cover. If there is no cover on the outdoor unit, remove the bolts from the maintenance board. Pull in the direction of the arrow on Figure 34 to remove the protection board.

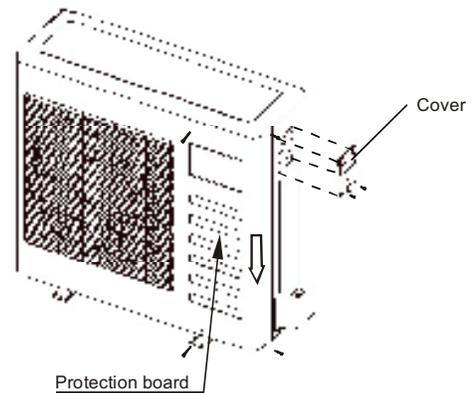


Figure 34

2. Connect the connective cables to the terminals with their corresponding, respective numbers on the terminal block of the indoor and outdoor units.
3. Reinstall the cover or the protection board.

Power Specifications:

Refer to charts 1 - 4 on the following pages.

Wiring Diagrams

Refer to the wiring diagrams beginning on page 18.

TESTING THE UNIT'S OPERATION

Perform a test operation after the installation of the entire system has been completed. Confirm the following have been done before the test operation:

1. The indoor and outdoor units are properly installed.
2. Tubing and wiring are correctly completed.
3. The refrigerante pipe system has been checked for leaks.
4. There are no obstructions and the pipes are draining freely.
5. Heating insulation is working.
6. Ground wiring is connected correctly.
7. The length of the tubing and the added charge of the refrigerant have been recorded.
8. The power voltage matches the rated voltage of the air conditioner.
9. There are no obstacles at the outlet and inlet of the outdoor and indoor units.
10. The gas side and liquid side valves are both open.
11. The air conditioner is pre-heated by turning on the power.

According to the user's requirement, install the remote control frame where the remote control's signal can reach the indoor unit smoothly.

Testing the unit:

With the remote control, set the air conditioner in COOLING mode; check the following. If there is any malfunction, resolve it according to the "Troubleshootin" section in the User's Manual.

THE INDOOR UNIT:

1. Do the switches and buttons on the remote control work properly?
2. Do the air flow louvers move normally?
3. Is the room temperature comfortable?
4. Are the indicator lights working normally?
5. Are the temporary buttons working?
6. Is drainage normal?
7. Are there any vibrations or abnormal noises during operation?
8. If the unit is a heating/cooling model, does the unit heat as well as cool?

THE OUTDOOR UNIT:

1. Are there any vibrations or abnormal noises during operation?
2. Are the noises, air or condensation created by the unit of sufficient levels that they would create a problem for your neighbors?
3. Are there any refrigerant leaks?

NOTE: The unit is equipped with a three minute compressor delay feature. When the unit is restarted immediately after shut off (or power outage), the unit will begin operation in three minutes.

Model (R-22, 50 Hz) Cooling Only		12-18	24	30-36	36-60
Power	Phase	1-Phase	1-Phase	1-Phase	3-Phase
	Frequency Volt	220-240v~ 50 Hz	220-240v~ 50 Hz	220-240v~ 50 Hz	318-415v 3N~ 50 Hz
Circuit Breaker/Fuse (A)		20/16	30/25	35/30	40/30
Indoor Unit Power Wiring (mm ³)		3x2.5	3x2.5	3x4.0	5x4.0
Indoor/Outdoor Connecting Wiring (mm ³)	Ground Wiring	2.5	2.5	4.0	4.0
	Outdoor Unit Power Wiring	----	3x2.5	3x4.0	5x4.0
	Strong Electric Signal	3x2.5	1x1.5	1x1.5	1x1.5
	Weak Electric Signal	'----	'----	'----	'----

Chart 1

Model (R-22 & R-410A, 50 Hz) Cooling & Heating		12-18	24	30-36	36-60
Power	Phase	1-Phase	1-Phase	1-Phase	3-Phase
	Frequency Volt	220-240v~ 50 Hz	220-240v~ 50 Hz	220-240v~ 50 Hz	318-415v 3N~ 50 Hz
Circuit Breaker/Fuse (A)		20/16	30/25	35/30	40/30
Indoor Unit Power Wiring (mm ³)		3x2.5	3x2.5	3x4.0	5x4.0
Indoor/Outdoor Connecting Wiring (mm ³)	Ground Wiring	2.5	2.5	4.0	4.0
	Outdoor Unit Power Wiring	----	3x2.5	3x4.0	5x4.0
	Strong Electric Signal	5x2.5	3x1.5	3x1.5	3x1.5
	Weak Electric Signal	2x0.75	2x0.75	2x0.75	'----

Chart 2

Model (R-22, 60 Hz) Cooling Only		12-18	18	24	30-36	48-60
Power	Phase	1-Phase	1-Phase	1-Phase	1-Phase	1-Phase
	Frequency Volts	208-230v~ 60 Hz	208-230v~ 60 Hz	208-230v~ 60 Hz	208-230v 60 Hz	208-230v~ 60 Hz
Circuit Breaker/Fuse (A)		20/16	20/16	30/25	35/25	50/45
Indoor Unit Power Wiring (mm ³)		3x2.5	3x2.5	3x2.5	3x2.5	3x2.5
Indoor/Outdoor Connecting Wiring (mm ³)	Ground Wiring	2.5	2.5	2.5	4.0	8.0
	Outdoor Unit Power Wiring	----	3x2.5	3x2.5	3x4.0	3x8.0
	Strong Electric Signal	3x2.5	----	----	----	----
	Weak Electric Signal	----	2x1.5	2x1.5	2x1.5	2x1.5

Chart 3

Model (R-22, 60 Hz) Cooling & Heating		12-18	24	30-36	36-60
Power	Phase	1-Phase	1-Phase	1-Phase	3-Phase
	Frequency Volt	208-230v~ 60 Hz	208-230v~ 60 Hz	208-230v~ 60 Hz	208-230v~ 60 Hz
Circuit Breaker/Fuse (A)		20/16	30/25	35/30	50/45
Indoor Unit Power Wiring (mm ³)		3x2.5	3x2.5	3x2.5	3x2.5
Indoor/Outdoor Connecting Wiring (mm ³)	Ground Wiring	2.5	2.5	4.0	4.0
	Outdoor Unit Power Wiring	3x2.5	3x2.5	3x4.0	3x8.0
	Strong Electric Signal	---	---	---	---
	Weak Electric Signal	4x1.5	4x1.5	4x1.5	4x1.5

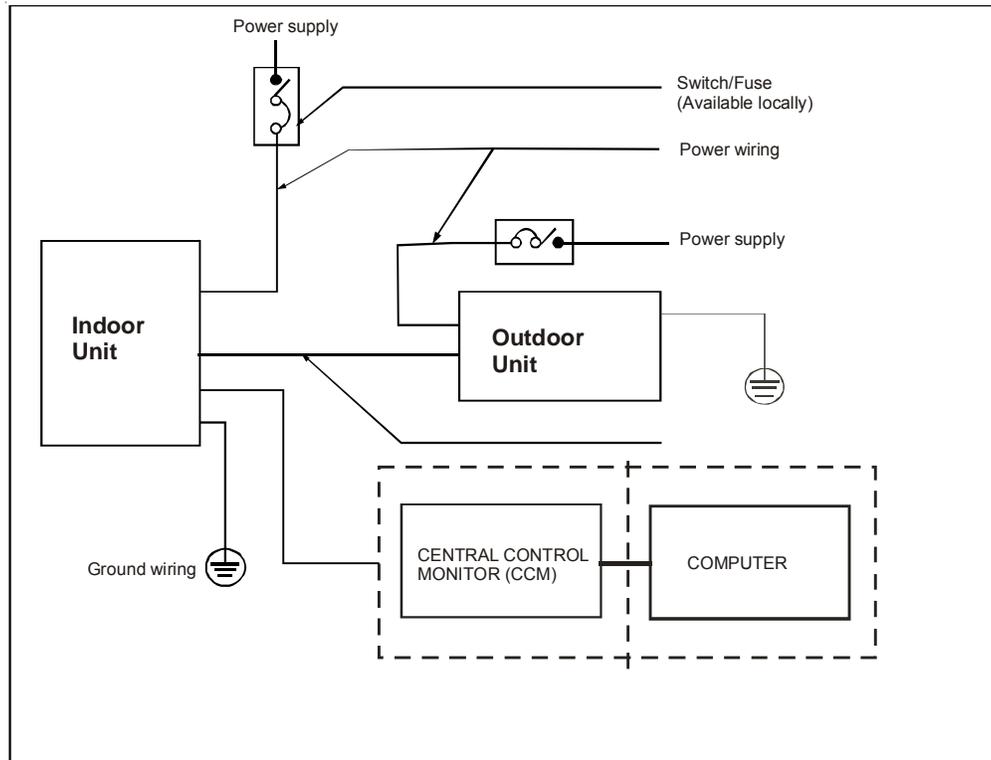
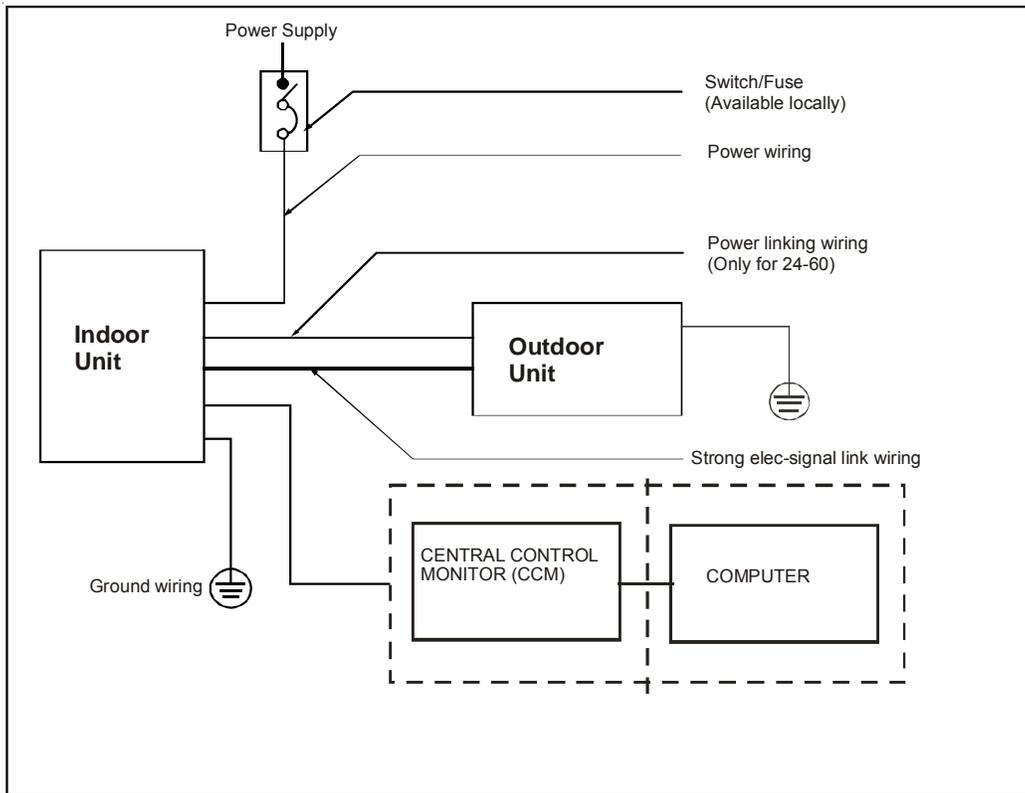
Chart 4

WIRING DIAGRAMS



WARNING

HIGH VOLTAGE!
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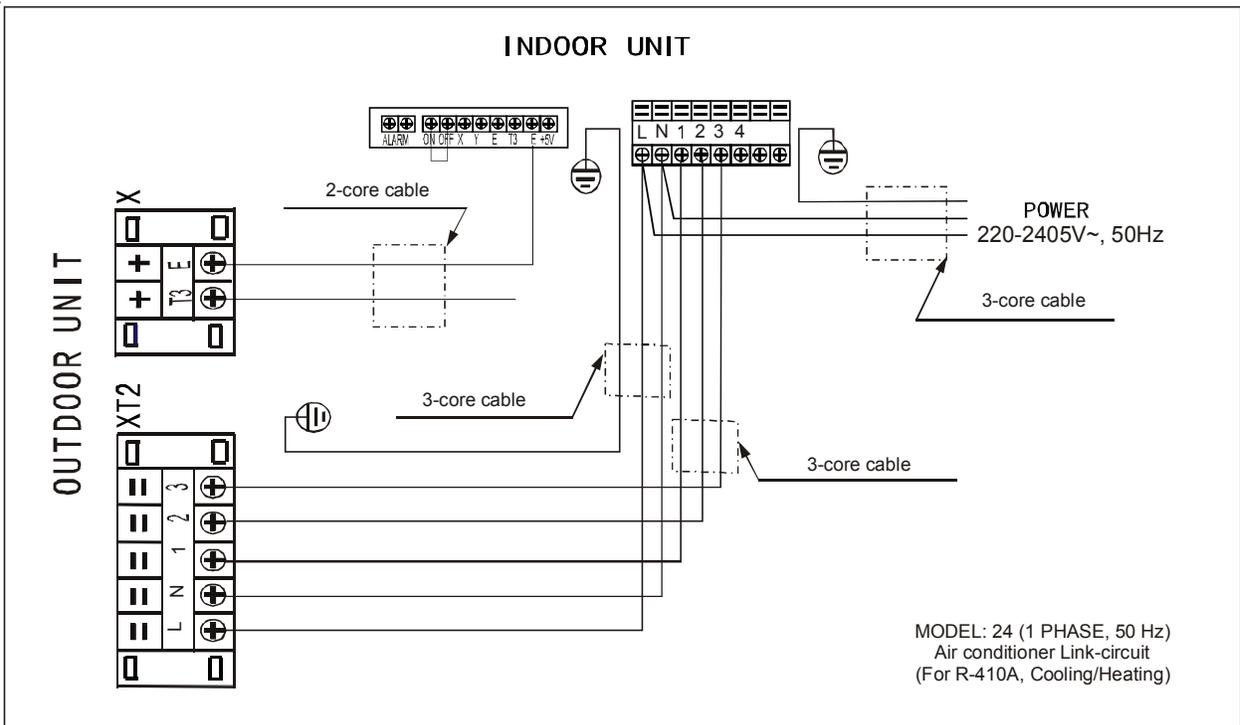
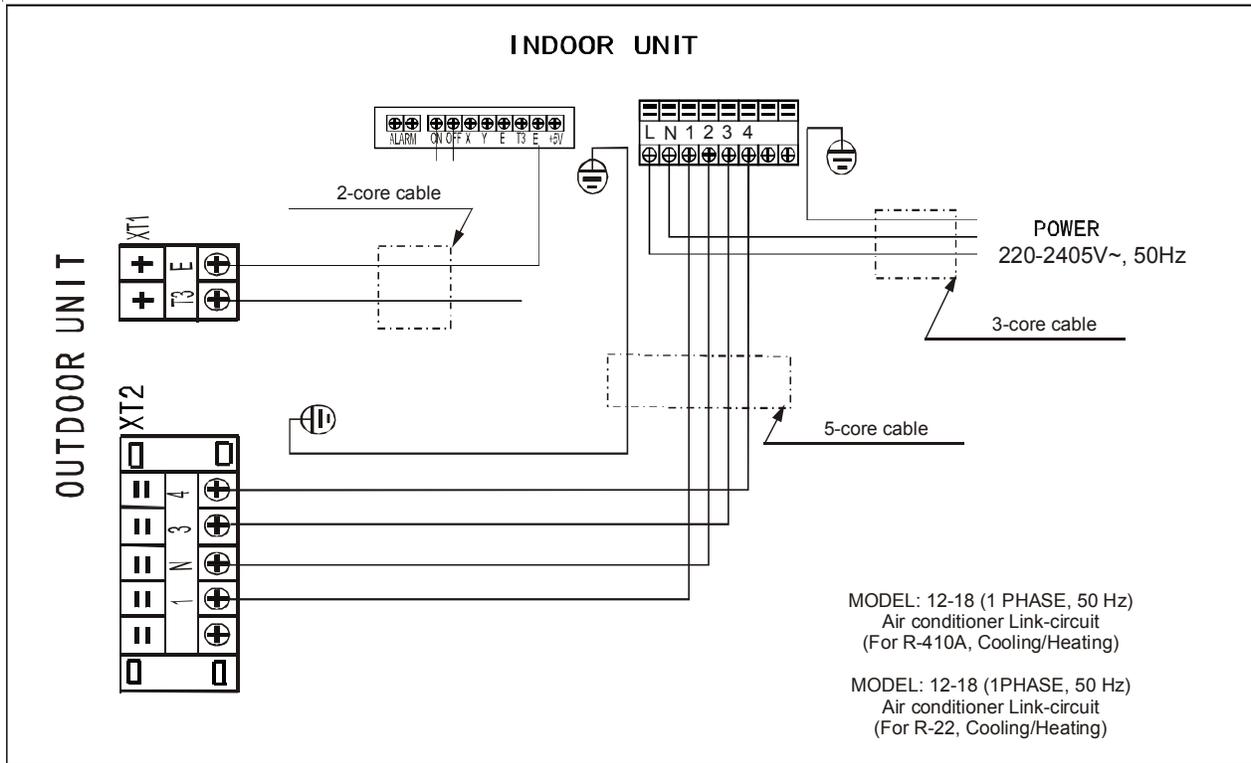


Wiring is subject to change. Always refer to the wiring diagram on the unit for the most up-to-date wiring.

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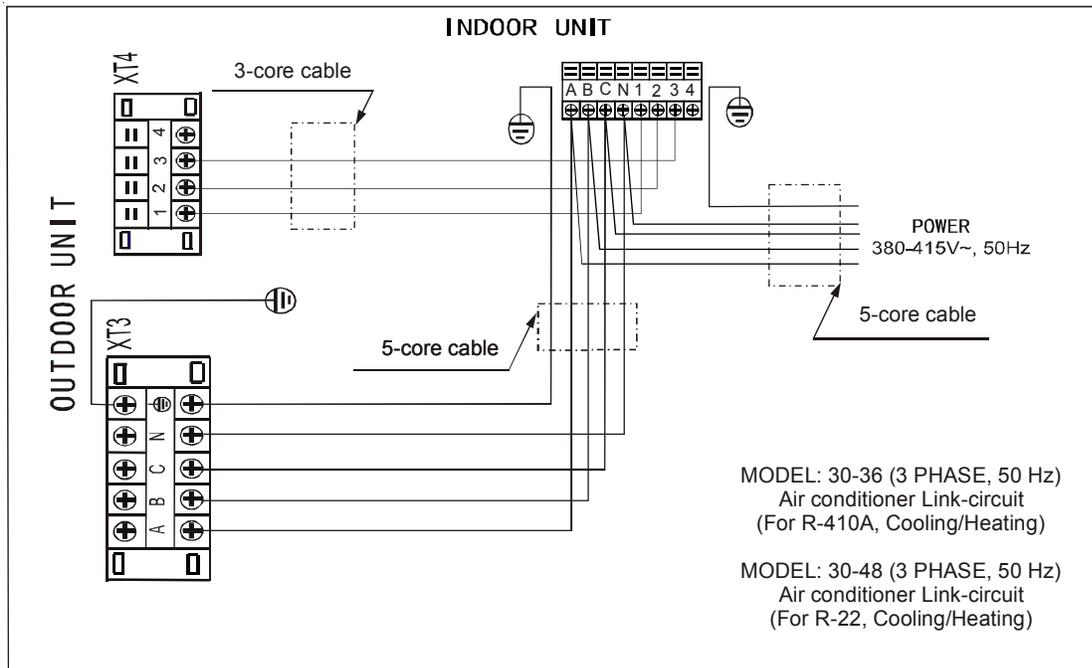
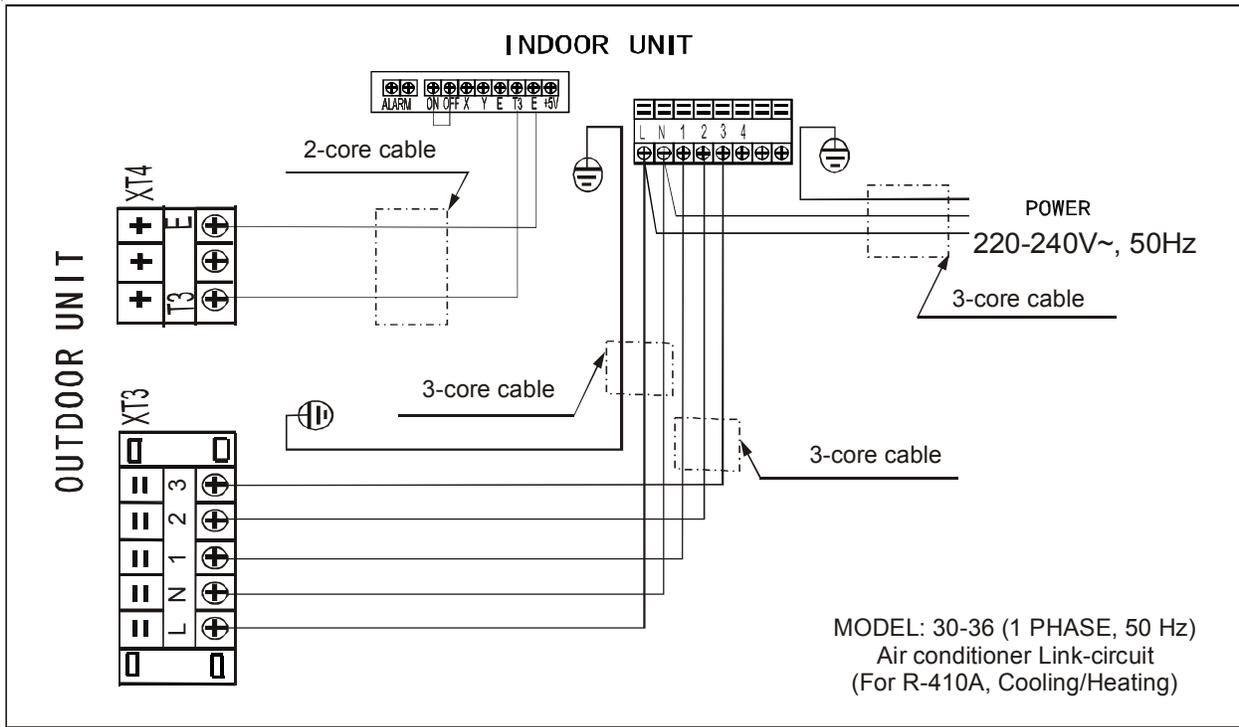


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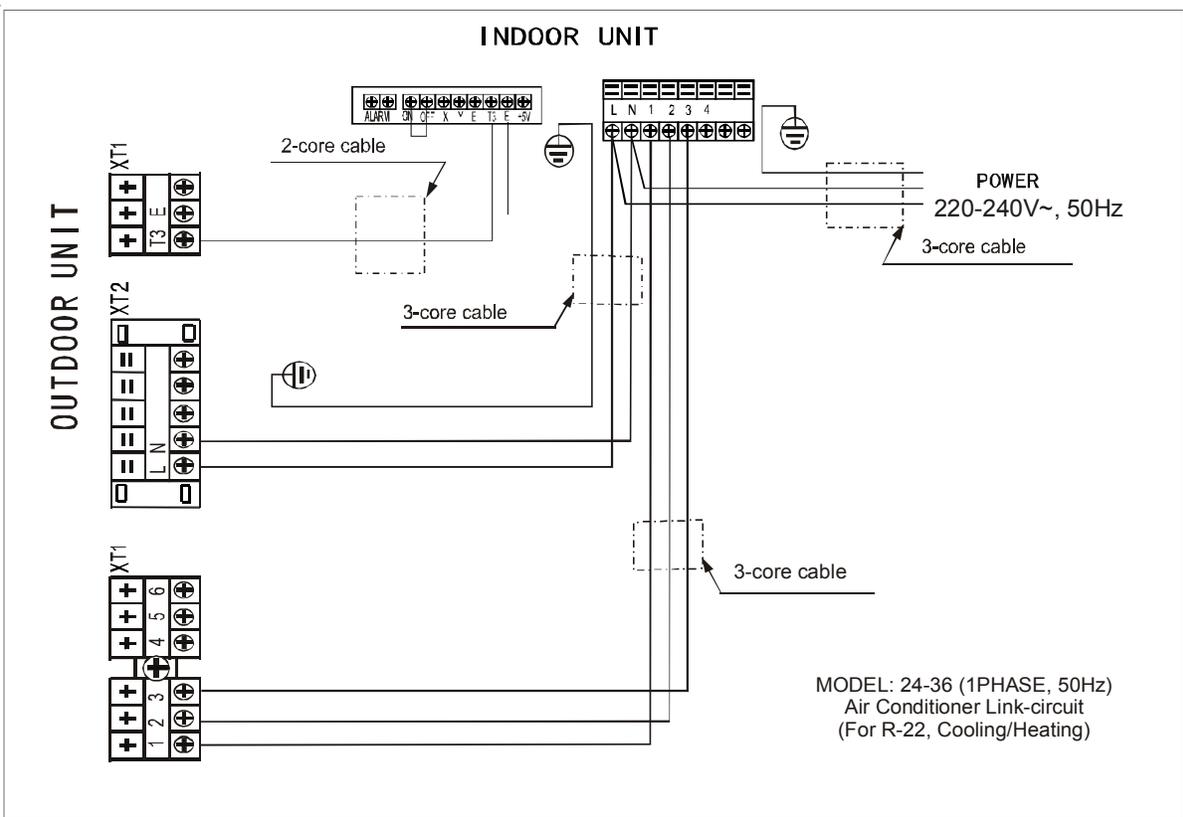
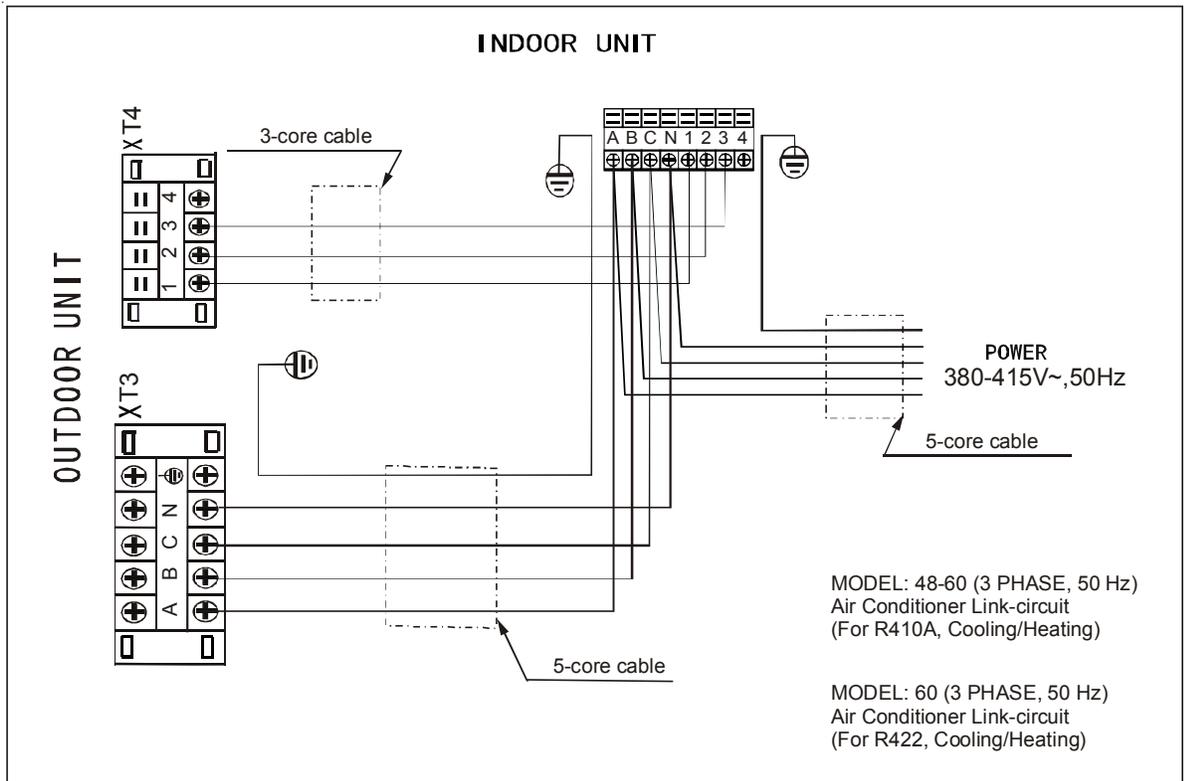


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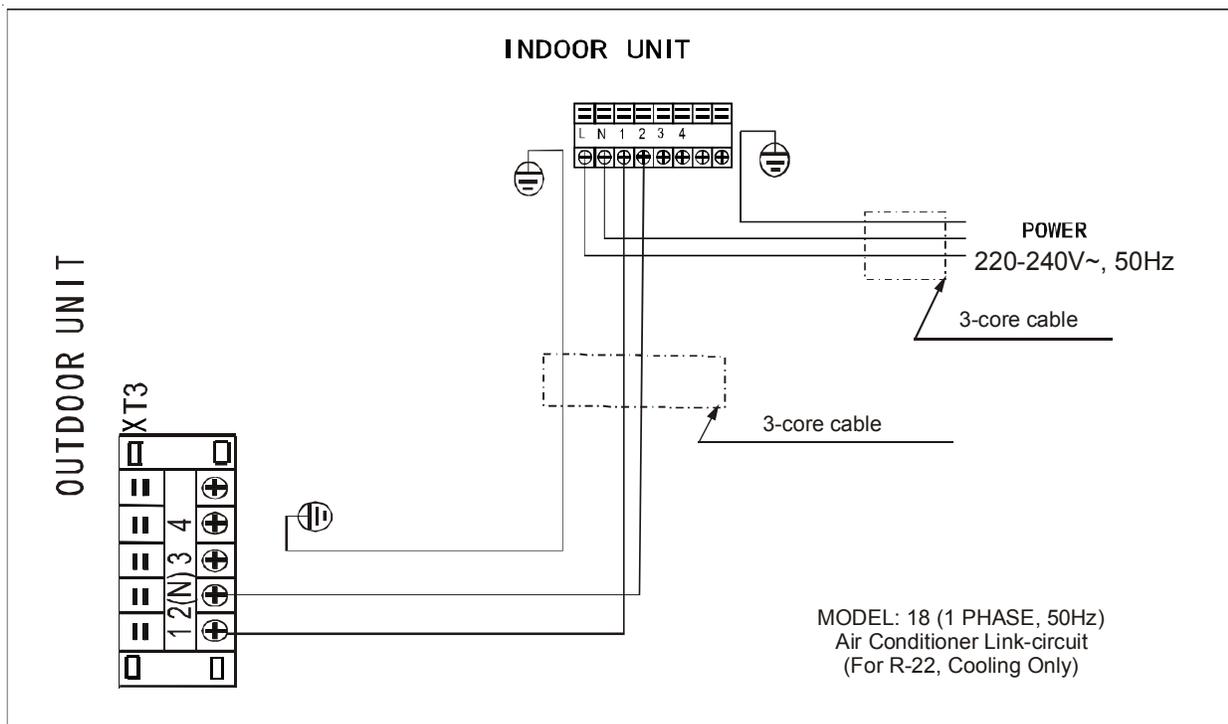
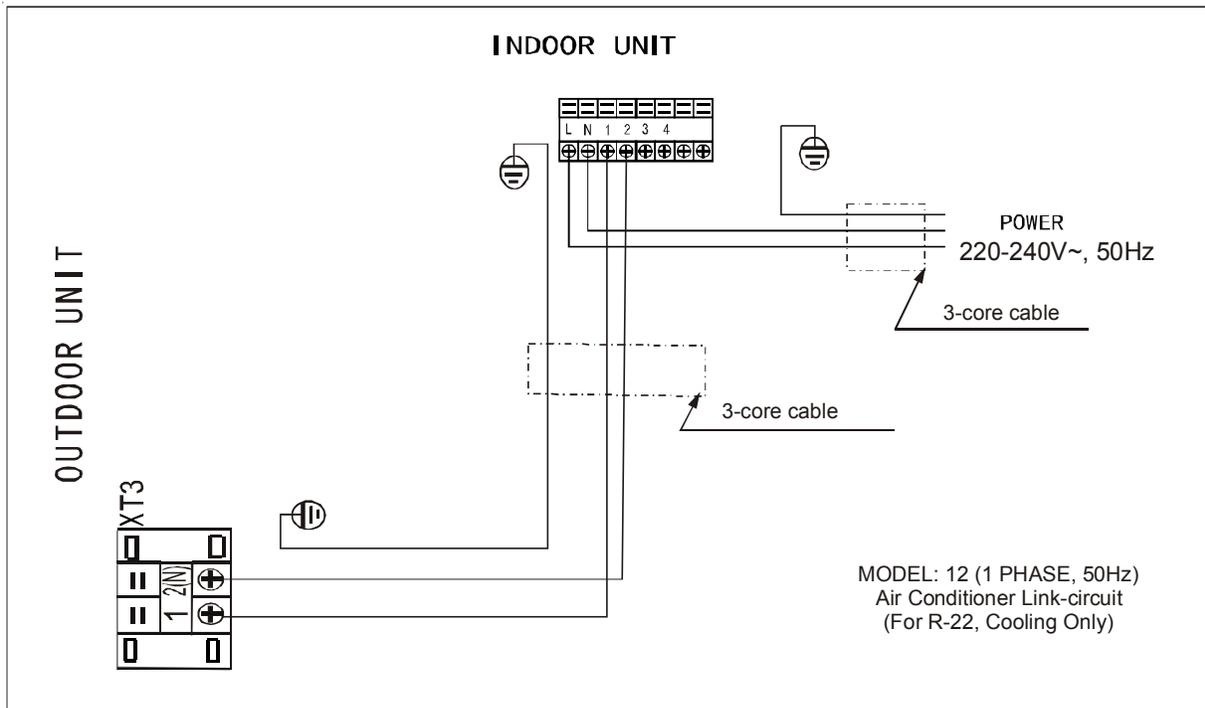


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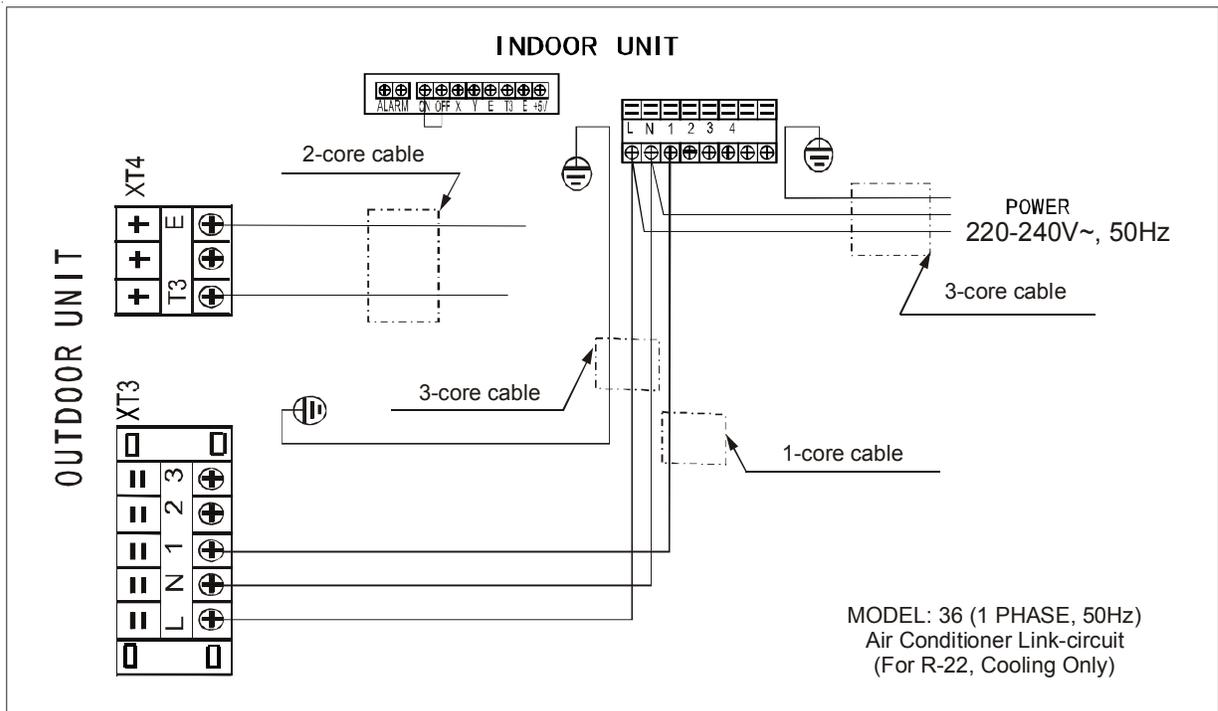
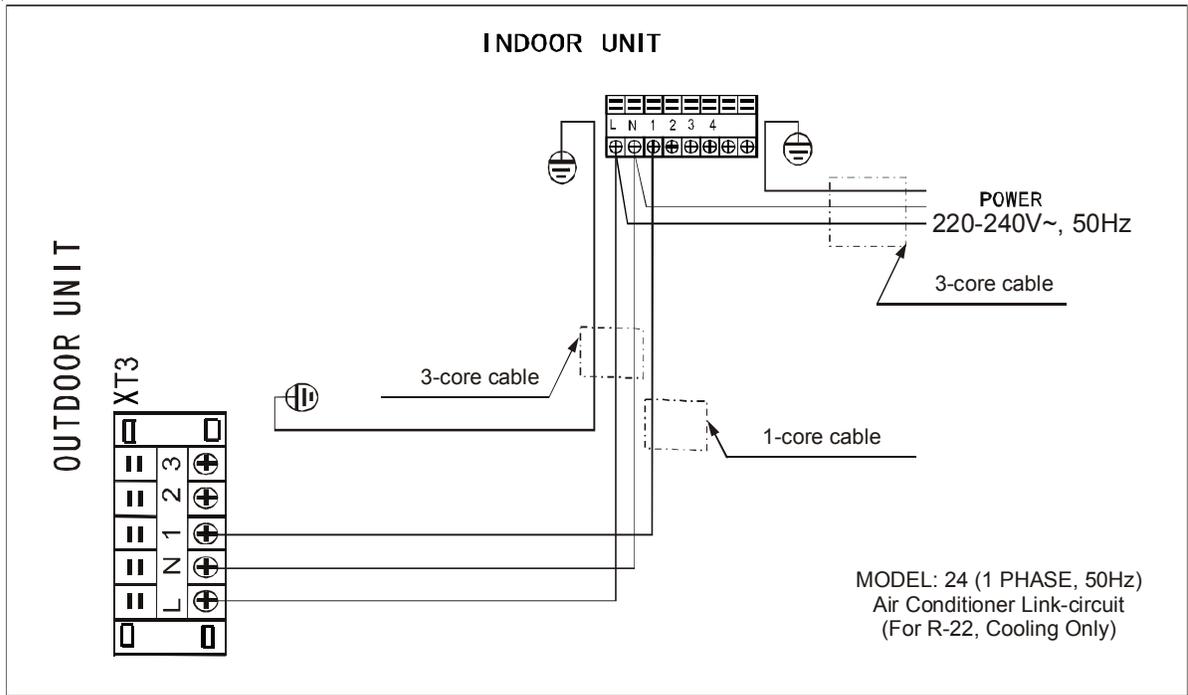
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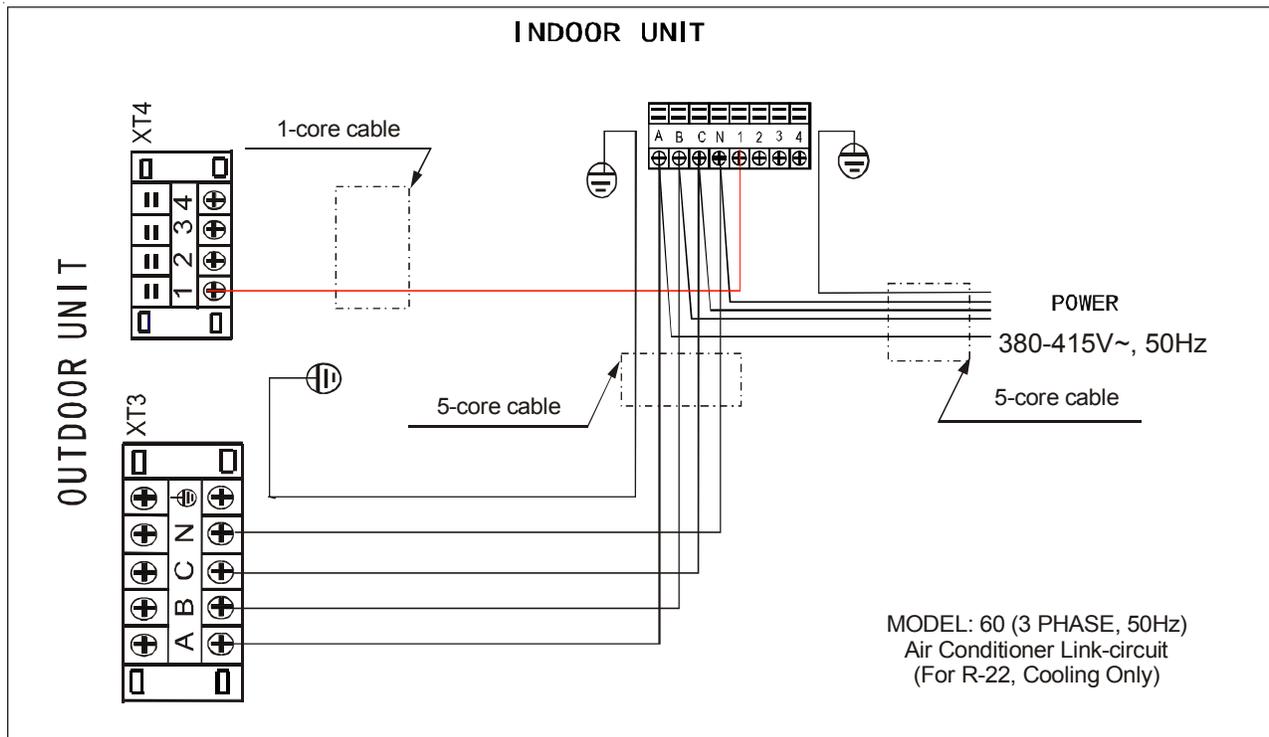
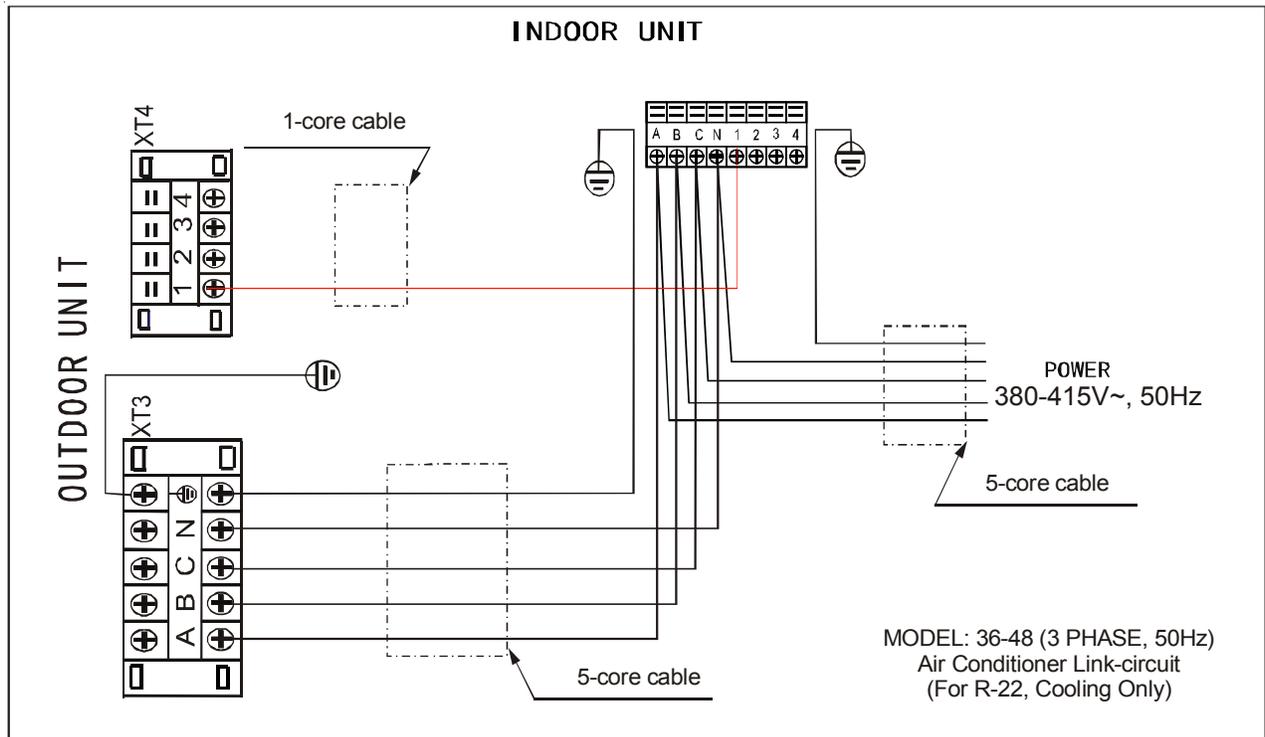
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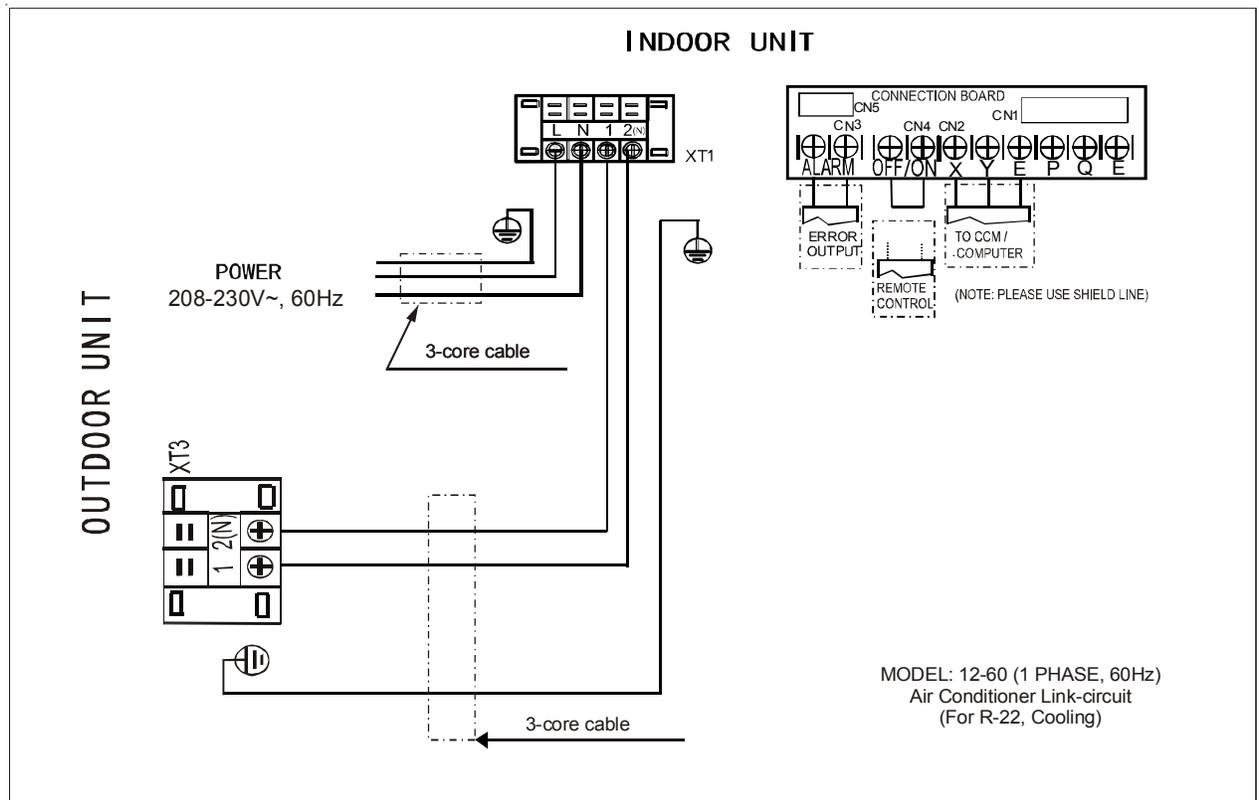
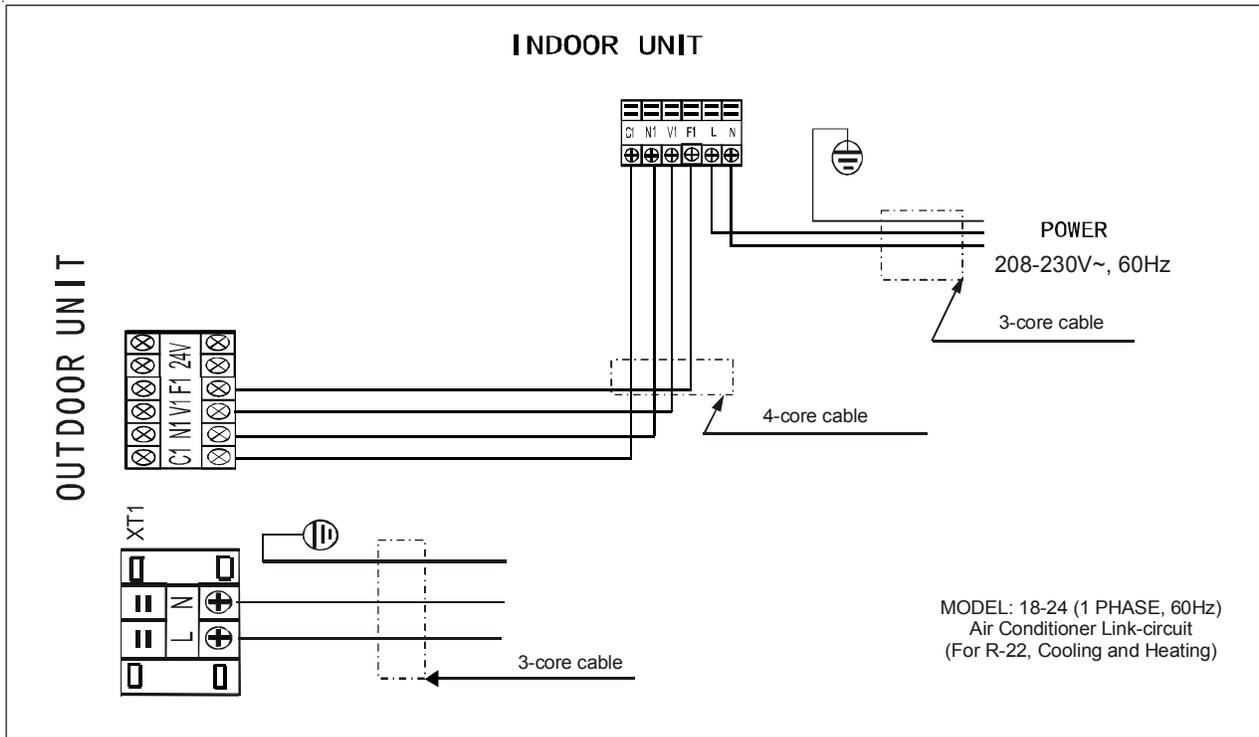
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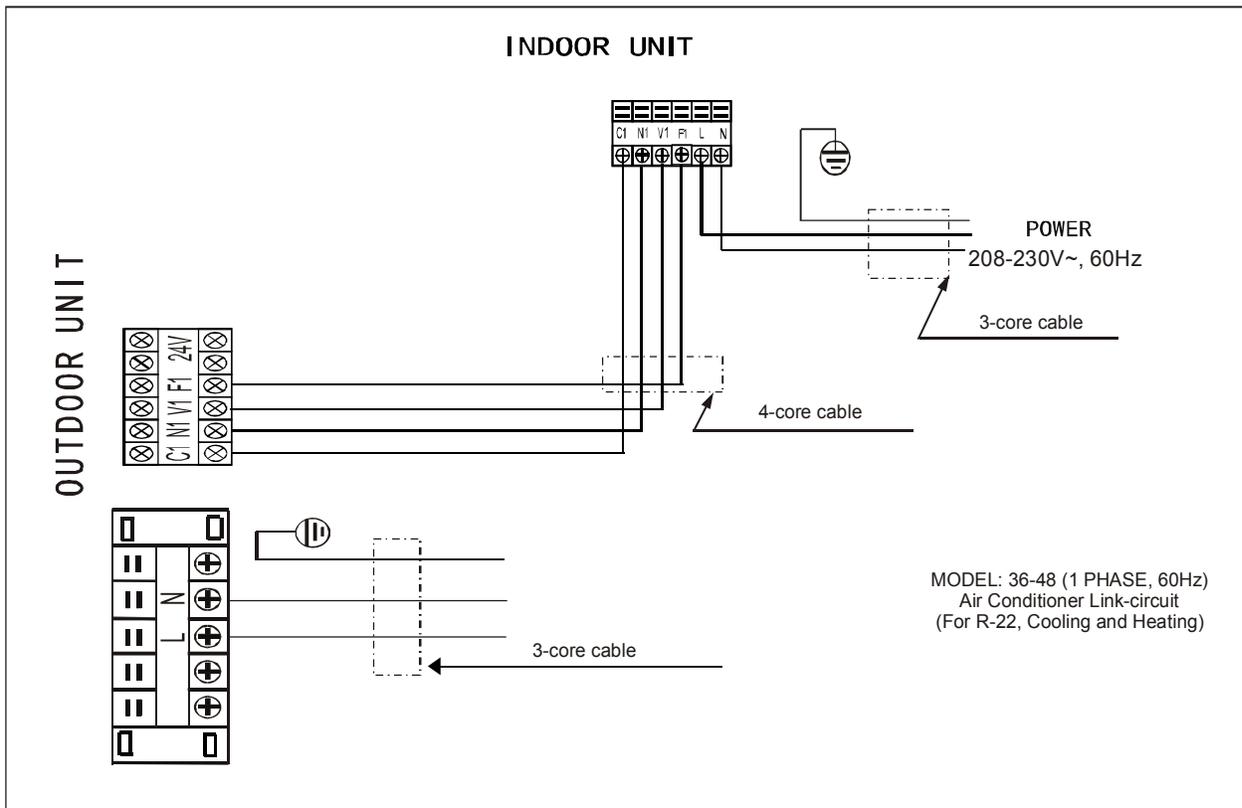
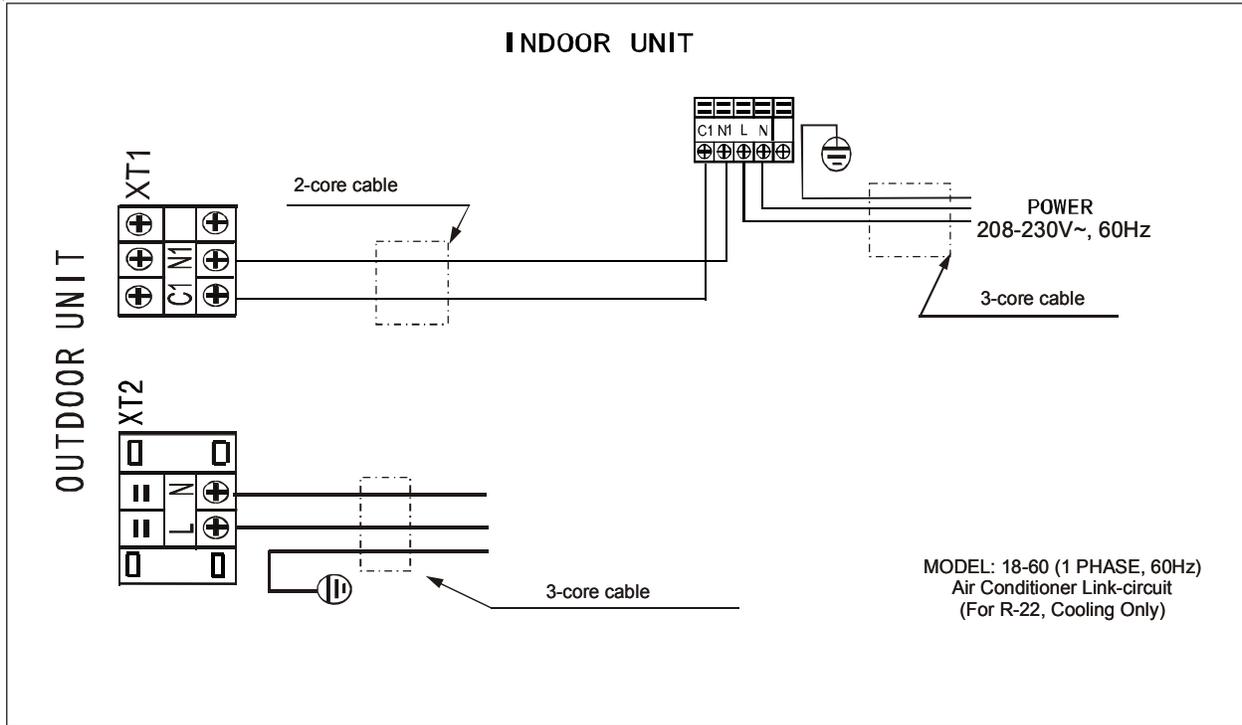
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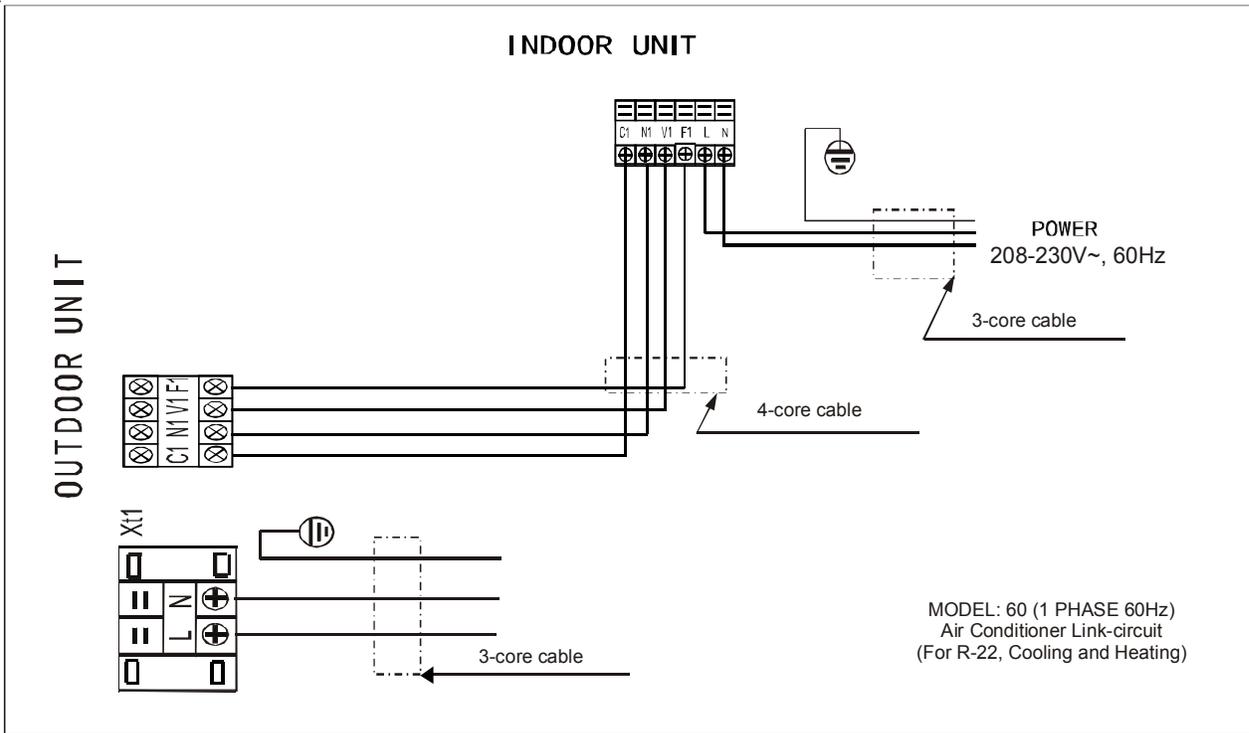
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Due to our commitment to continuing improvement, design and specifications are subject to change without prior notice.

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