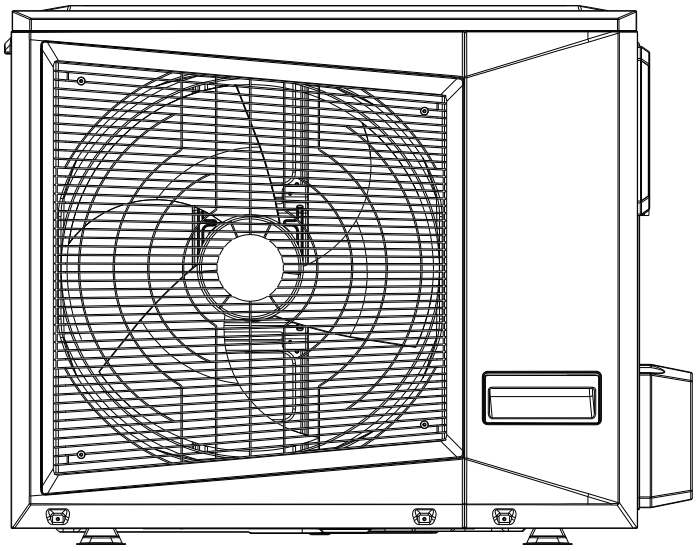
ComfortStar®

Installation Manual

Outdoor Unit:CHD12CA-14,CHD18CD-14,CHD24CD-14, CHD30CD-14, CHD36CD-14, CHD48CD-14



RECOGNIZE THIS SYMBOL AS A SAFETY PRECAUTION

ATTENTION INSTALLING PERSONNEL

Prior to installtion on,thoroughly familiarize yourself with this Installation Manual.Observe all safety warnings.
During installation or repair,caution is to be observed
It is your responsibility to install the product safely and to educate the customer on its safe use

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CONTENTS

1. SAFETY PRECAUTIONS

- Please read this installation manual carefully ahead of installation.
- Replacement can only be implemented by certified workers when the power cord is damaged.
- Products can only be installed by certified workers in line with local and national codes.
- Please contact with certified service technician for installation, repairing, and maintenance.
- Pictures in this manual can be different from the actual unit you brought, as they are only for interpretation purposes.
- Please contact the sales agent or the factory for updated design features or specification as they can be changed without advance notice for product upgrades.

The severity of safety precautions is graded by the following indications:

WARNING	The probability of death or serious injury.
CAUTION	The probability of injury or damage to property.

WARNING

- Defective installation: To avoid water leakage, electrical shock fire and invalid warranty caused by the defective installation, please follow the instructions strictly.
- Parts: Only the manufacturer’ s specified and supplied parts can be used.
- Location: To avoid the fall of the unit and the consequent injury, please choose a strong and stable location to withstand and install the unit correctly.
- Electrical work: To avoid electrical shock or fire, please follow local and national electrical codes and use the independent circuit and single outlet.
- Cable: To avoid the looseness of connection and the consequent excessive heat, please connect the specified cable tightly and clamp it.
- Control board cover: Wiring routing must be carefully organized to secure the control board cover securely. Otherwise, heat will build up at the terminal connection point, resulting in a fire or electrical shock.
- Piping connection: When connecting pipework, make sure air substances other than the prescribed refrigerant do not enter the refrigeration circuit. Otherwise, lesser capacity, abnormally high pressure in the refrigeration cycle, explosion, and damage will result.
- Power: To avoid the fire or an electric shock, please do not use an extension cord or adjust the length of the power supply cord, and do not share the single outlet with other electrical appliances.

CAUTION

- This equipment must be properly grounded and equipped with a ground leakage current breaker to avoid electrical shock.
- Do not install the unit in a location where combustible gas could leak. Or gas leaks and collects near or around the unit and cause fire

2. OPERATING INSTRUCTIONS

Effective operating temperature of Air Conditioners (OUTSIDE): 65 °F (18°C) - 115°F (46.1°C).

Please make sure your units operate in this range to avoid the failure of operation or the invalid warranty.

TO OPERATE:

NOTE: *Type and model may lead to different operations of thermostat. Detailed information can be found in the operating manual which provided with the thermostat. The instructions below are applicable to most standard thermostat models.*

- Switch the wall thermostat to "cool".
- By adjusting the thermostat setting on the wall thermostat, set the wanted temperature to keep the temperature between 63-86 ° F or 17-30 ° C. If the indoor temperature is higher than the setting, air conditioning will start to run and blow cold air in a few minutes later. It may take several hours of sustained operation for a warm, moist room or construction to lower the temperature to the thermostat set point for the first time. Once the set temperature reached, the unit will cycle the operation.
- If you want to turn on the fan only when cooling, turn the "fan" switch on the thermostat to "auto". And if you want sustained air circulation, turn the switch to “on” . The "on" setting usually can eliminate stagnant air to achieve better temperature control.

NOTE: *An unit installed and sized correctly will not cycle over 10 times in an hour. Call your local contractor or the factory if more appears on your unit.*

- To save energy, you can turn up the setting temperature on the thermostat when you’ re out, but less than 5 degrees. Setting at a correct temperature can cost less than change the temperature by more than 5 degrees or turn off the unit.

IMPORTANT

After shutting the system “off” , wait at least three minutes if you want to turn on the system again to provide time for the system to stabilize before running. Otherwise, may lead to unit damage and failure.

MAINTENANCE:

Simple regular maintenance is required:

Ensure that the coil of the outdoor is clean. Clean the coil regularly with a hose and remove all foreign matter such as papers, dust, etc.

WARNING Cut down the power first! If water is sprayed onto live electrical connections or power supplies, it may cause serious injury or death.

IMPORTANT!

Replacement:

Replacement of unauthorized products or parts is beyond factory warranties and may result in poor operational performance and/or may pose a hazard to service staff.

3. PRODUCT INFORMATION

3.1 UNPACKING AND INSPECTION

The condenser is shipped fully assembled and packed in its own carton box. Before shipped out to the freight company, all goods are inspected at the factory and in good condition. Upon receiving the goods, a visual inspection should be performed at the site as soon as possible. Any rough treatment or visible damage should be documented on the delivery receipt, and the material should be inspected in the presence of the carrier's representative. If any damage is detected, an assertion should be filed with the freight company right away.

3.2 COOLING OPERATION TEMPERATURE LIMITS

The condenser is designed to work in cooling mode at outside temperatures ranging from 65° F (18° C) to 115°F (46.1°C).

3.3 INDOOR UNIT USE AND SYSTEM EFFICIENCY

The condensing unit is designed to be compatible with a majority of main brands of household evaporator coils or air handlers. Imported ductless air handlers may be utilized, however they usually lack an expansion device. A thermostatic expansion valve with the right size is recommended. For details, please refer to AHRI's indoor competition certification product catalog.

3.4 THERMOSTAT AND INDOOR FAN DELAY

A fan delay should be included in the indoor unit. This can be achieved by installing a new fan time delay intended to operate with your own furnace or air handler. [See Table 1].

Table 1

MODEL SIZE	12K	18K	24K	30K	36K	48K
DELAY	115s	90s	90s	90s	100s	65s

Fan delay is available from most brands of electronic thermostats. The installer is responsible for the correct specified thermostat. Correct temperature control and correct operation of the unit depend on the correct selection and location of the thermostat. Please refer to the thermostat manufacturer' s installation instructions for more recommendations. It is best to avoid external walls and locations where the thermostat is exposed to direct sunlight, and locations where air from the air supply regulator or unit outlet may blow to the thermostat. In addition, thermostats should be prevented from being installed where they could be struck by closing doors or in busy areas.

WARNING

An in-line filter drier is required when installing the unit. Because the factory does not supply the filter drier, the customer should purchase it locally to ensure any particulates or moisture that may exist in the unit will be removed. Warranty could be voided if installing without an in-line filter drier.

4. OUTDOOR UNIT INSTALLATION

4.1 UNIT LOCATION AND MOUNTING

Locate the condenser as close to the indoor unit as possible. The maximum unit distance and fall drop (compressor above evaporator) must be taken into account [See **Table 2**]. Do not use pipes exceeding allowable pipe lengths.

Table 2

Refrigerant Piping		Capacity(Kbtu/h)					
		12K	18K	24K	30K	36K	48K
Liquid-Gas	In.	1/4-1/2		3/8-5/8	3/8-3/4		
Max.Refrigerant Line Length*	Ft.	82					98
Max.Elevation Vertical Lift**	Ft.	33					49

*Minimum pipe length must be no less than 15 feet.

** When the outdoor unit is mounted above the indoor unit, set "P" trap risers every 10 feet.

NOTE: *When the outdoor unit is installed above the indoor unit, the oil traps must be installed every 10 feet.*

Mount the outdoor unit on a solid surface, such as a concrete slab, capable of bearing the weight of the unit.

If the installation location allows the unit to be exposed to strong winds (such as sea side applications), make sure the unit has a wind barrier [See **Fig. 1**]. This will help the fans to function properly by preventing strong rafales from entering the unit' s cabinet.

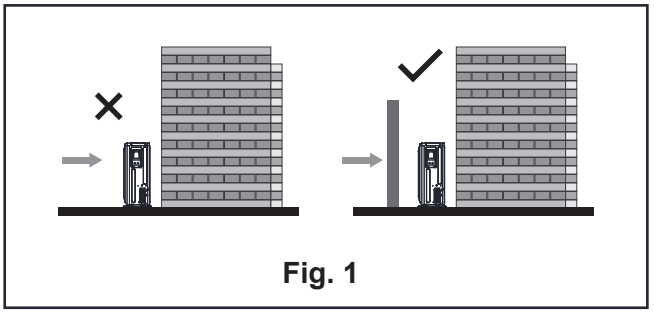


Fig. 1

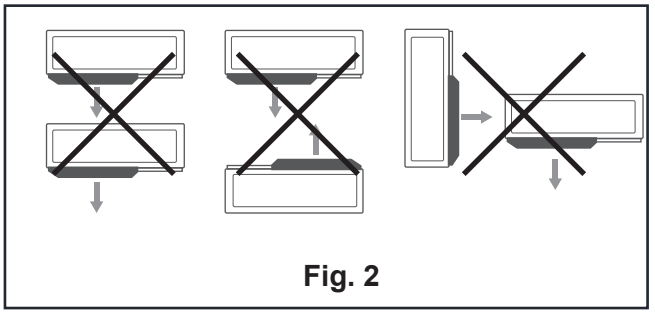


Fig. 2

Ged rid of locations where water, snow, or ice may fall from a roof onto the unit. In climates where there is snow, position the unit away from areas prone to drifting. Ensure the location of the unit will not be subject to snow drifts, large amount of snow or leaves or other seasonal debris. If inevitable, provide the unit with awning.

An awning can be built over the outdoor unit to prevent direct sunlight or rain exposure or snowfall. Make sure the awning is at least 2 feet above the top of the equipment enclosure.

Do not locate two or more units in a way that will block air flow or in a way that hot air from one unit will blow into a nearby unit [See **Fig. 2**].

Make sure air flows freely in and out of the unit. Inlets/outlets should be kept away from obstacles such as walls and bushes. Minimum clearances must be adhered to [See **Fig. 3 & 4**].

4.2 CLEARANCES

Enough clearance around the unit for installation and maintenance must be guaranteed. Clearance must be maintained to ensure that the inlet and outlet air is not blocked.[See **Fig. 3**].

Secure the outdoor unit to a concrete or solid surface with 10mm (3/8") diameter bolts and nuts [See **Fig. 4**]. Particularly recommend anchoring for seaside/strong wind applications and/or earthquake prone areas

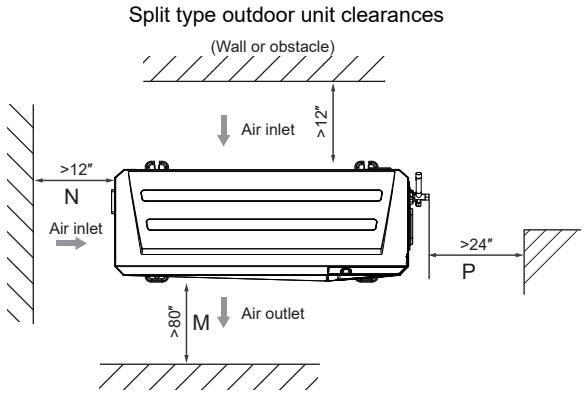


Fig. 3

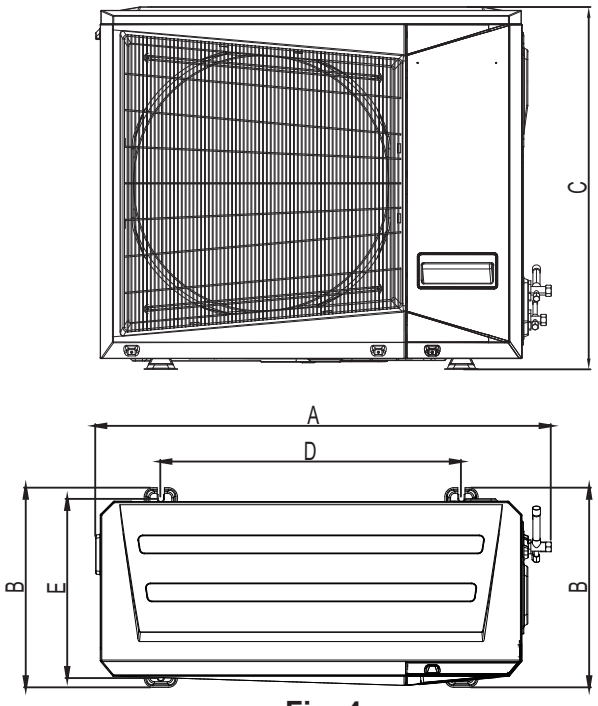


Fig. 4

Table 3 Units in inches

MODEL SIZE	A	B	C	D	E
12K	33.5	13.6	21.9	20.0	11.0
18K	36.0	15.0	27.6	21.4	12.8
24K/30K/36K	40.0	17.5	31.9	26.4	15.2
48K	43.3	20.8	34.3	25.0	17.4

5. WIRING

5.1 ELECTRICAL WIRING AND POWER SUPPLY VOLTAGE

All electrical wiring must meet NEC and wiring specifications in the locality. The operating voltage, phase, ampacity, maximum overcurrent protection and minimum circuit ampacity shall be displayed on the nameplate.

According to the requirements of local codes, the contractor shall provide a separate branch circuit for the unit for overcurrent protection. Connect the power cord to the unit through a weatherproof disconnect box and conduit. The disconnect box must be within sight of the unit and easily accessible (usually within 3 feet).

Check the quantity of wires required in the unit wiring diagram. All wiring shall be tidy to prevent crease and abrasion.

Wiring incorrectly and / or mismatched power supply may cause compressor and other electrical components to fault and invalidate the warranty.Make sure appropriate electrical power is available for connection, see name plates, wiring diagrams and electrical datas [See **Table 4**] for reference.

CAUTION: The input supply voltage must be the same as the designed rated voltage of the unit and shall not exceed ±10% of the rated voltage. In addition, guaranteeing the unit is correctly grounded.

Table 4

MODEL SIZE		12K	18K	24K	30K	36K	48K
DELAY	PHASE	1PHASE	1PHASE	1PHASE	1PHASE	1PHASE	1PHASE
	VOLT	115V	208/230V	208/230V	208/230V	208/230V	208/230V
CIRCULT BREAKER/FUSE(A)		15	15	15	20	25	40
MINIMUM CIRCUIT AMPACITY(A)		11	10	11.5	14	16	25.5

ELECTRIC WIRING GAUGE

NOTE: *The cross-section areas of wires or lines should not be less than the corresponding ones listed in the table below* [See **Table 5**] *; Besides, if the power wires is quite long from the unit, please choose the windings with larger cross-section area to guarantee the normal power supply.*

Table 5

MODEL SIZE		12K	18K	24K	30K	36K	48K
Power Line	Line Quantity	3	3	3	3	3	3
	Line Diameter(AWG)	14	14	14	12	12	10
Signal Line	Line Quantity	2	2	2	2	2	2
	Line Diameter(AWG)	20	20	20	20	20	20

NOTE1: *Please combine the unit instructions for additional writing connection with the installation instructions of the 24V thermostat.*

NOTE2: *For reference only, the actual wiring diagram shall prevail.*

5.2 OUTDOOR UNIT WIRING CONNECTION

- Take away the electric control box cover from the outdoor unit.
- A loop shall be formed in the harness to prevent water from entering the outdoor unit [See Fig. 5].
- Wrap all unused cables with PVC/ electrical tape for insulation to ensure that they will not contact any other exposed electrical or metal components.

⚠	CAUTION	Incorrect wiring connections may cause electrical parts to malfunction. All wiring must comply with local and national electrical codes and be installed by qualified and skilled electricians.

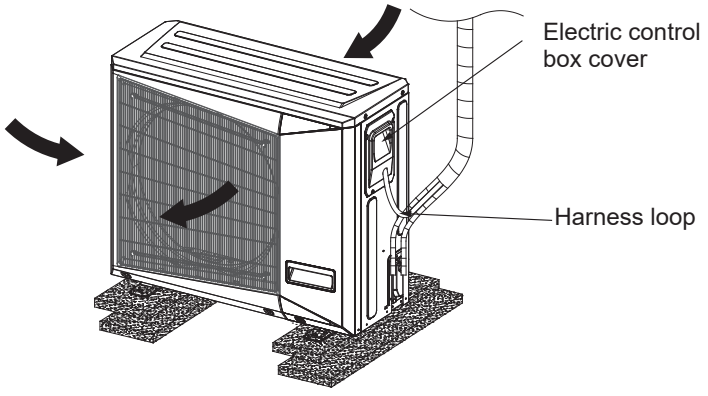
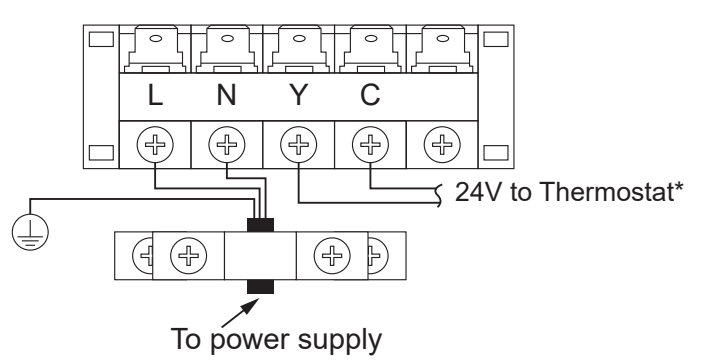


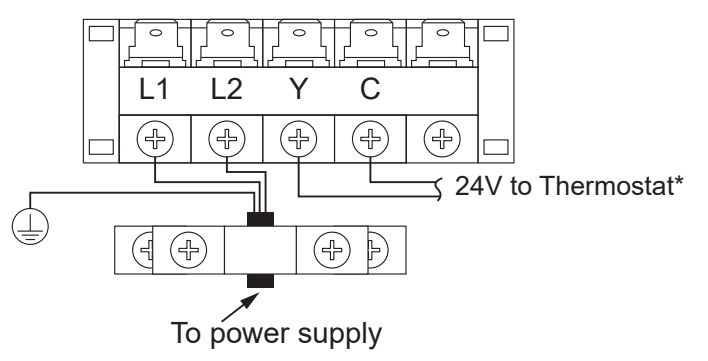
Fig. 5

5.3 TERMINAL BLOCK OF OUTDOOR UNIT

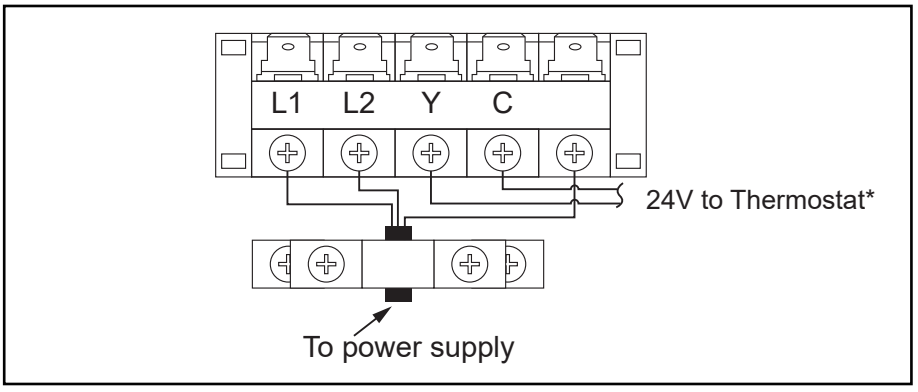
12K



18K~30K

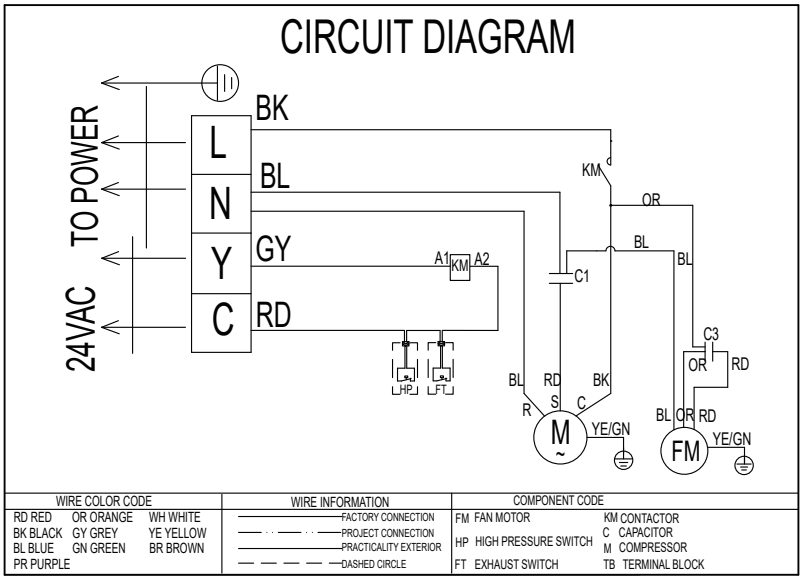


36K&48K

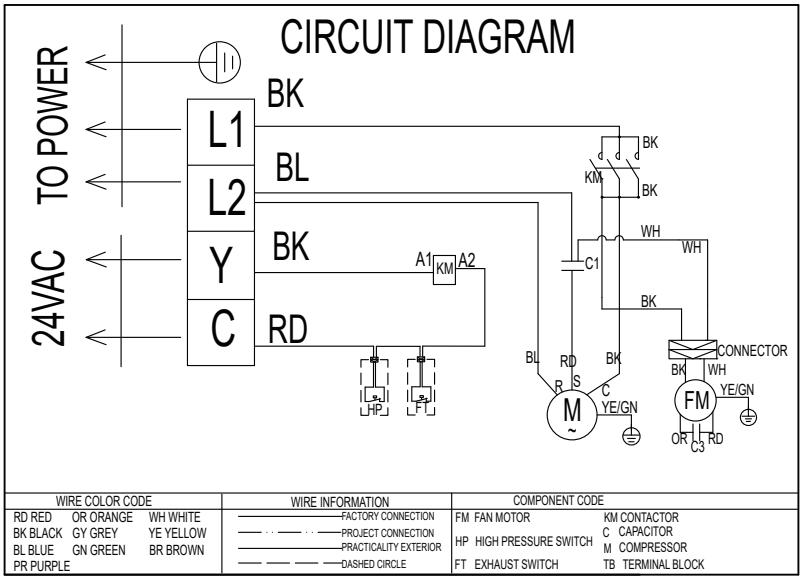


5.4 CIRCUIT DIAGRAM

12K

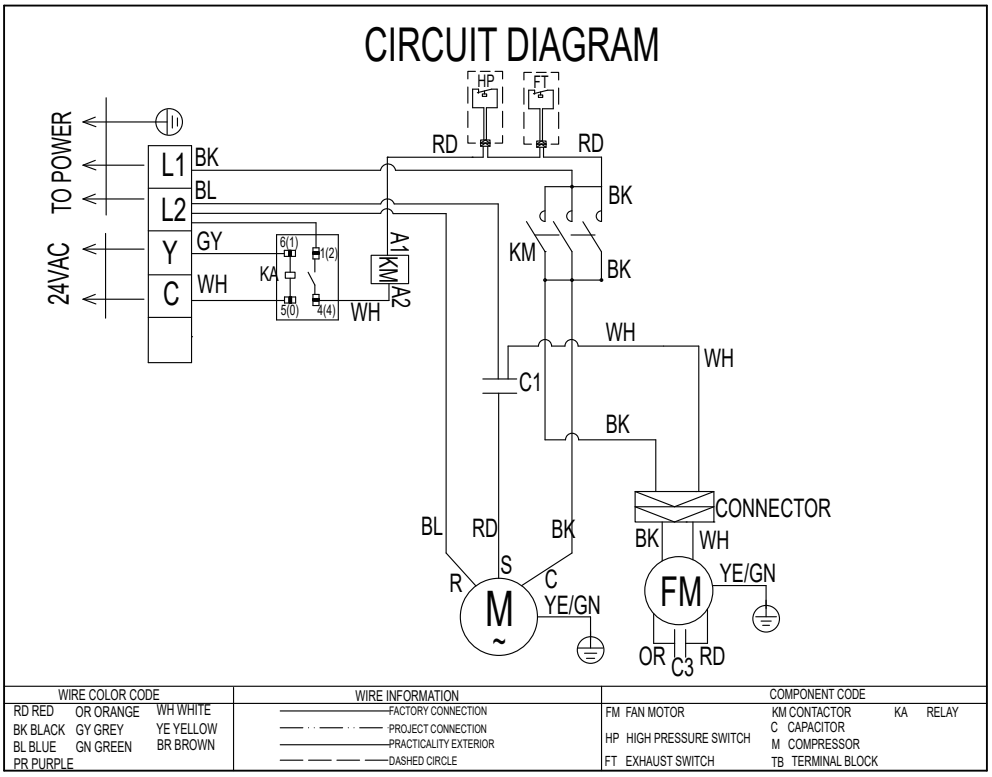


18K

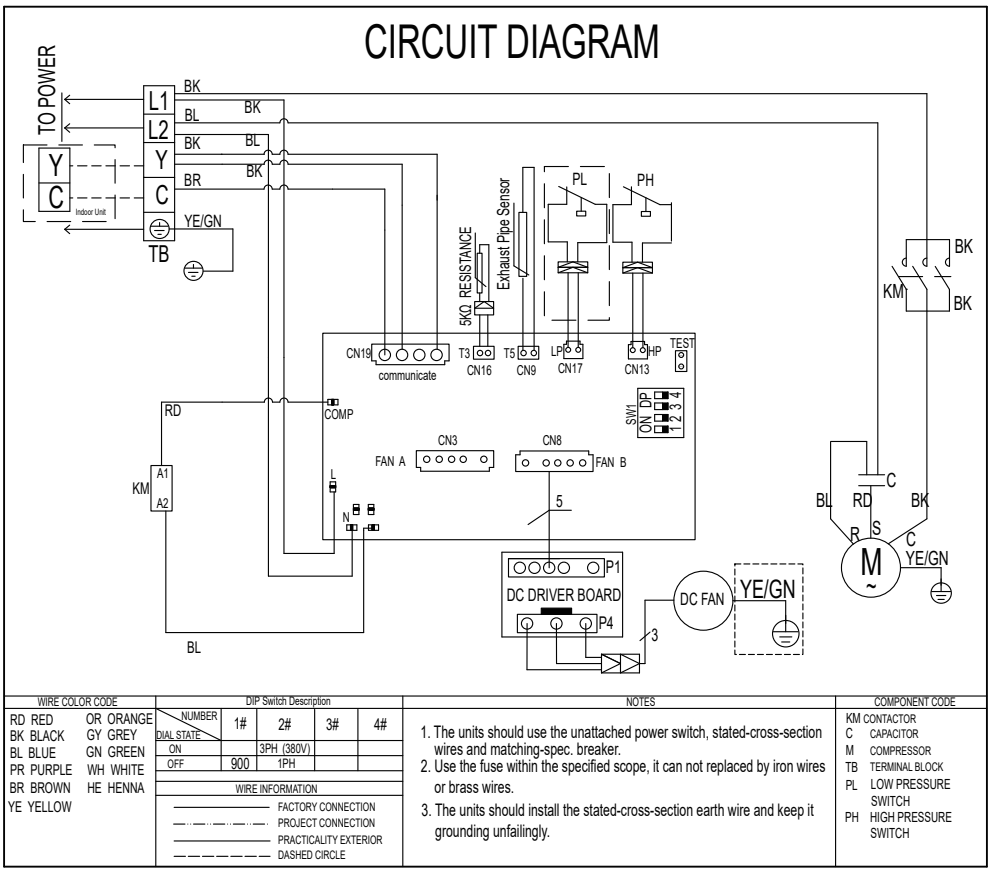


NOTE: *For reference only, the actual wiring diagram shall prevail*

24K&30K

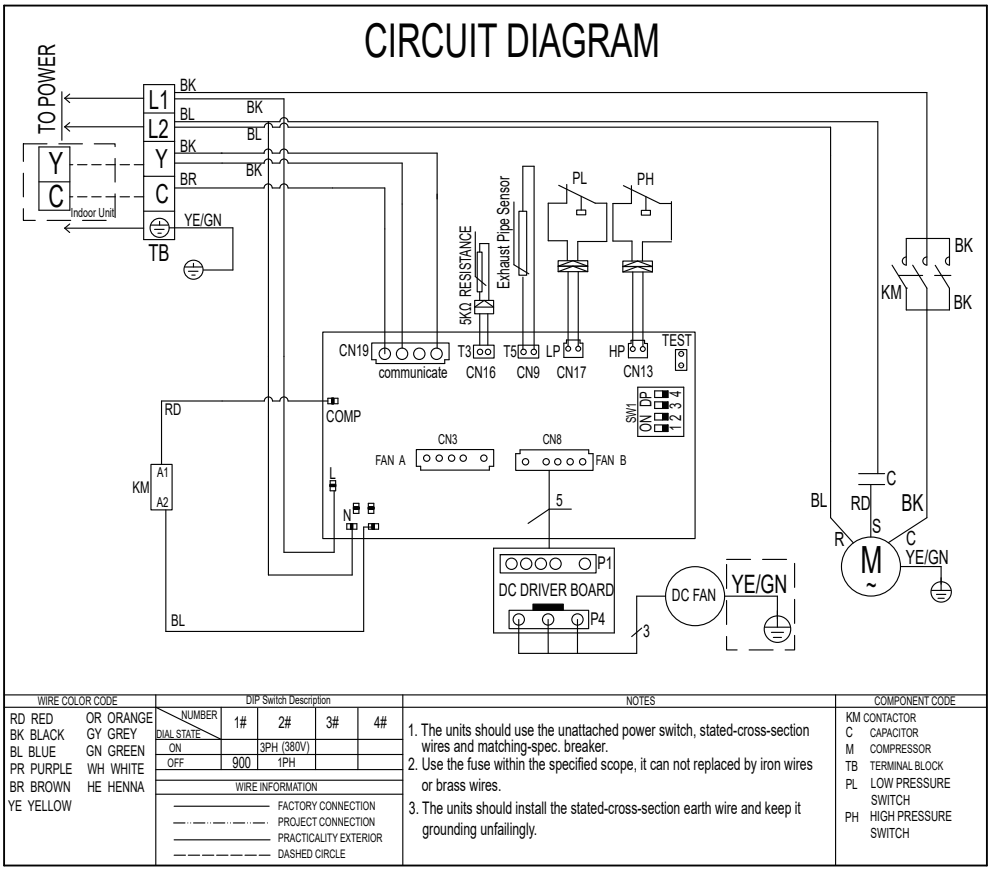


36K



NOTE: *For reference only, the actual wiring diagram shall prevail*

48K



NOTE: *For reference only, the actual wiring diagram shall prevail*

6. REFRIGERANT PIPING

The length of refrigerant pipes and the quantity of bends decide the pressure drop, which influences capacity and efficiency of the system and oil return to the compressor. The connections of outdoor unit are brazed. The diameter of the tube must be the same as the that provided at the service valves. Over sizing lines will incure inadequate oil return to the compressor, which is beyond the warranty, as well as overmuch refrigerant charge [See **Table 2**].

Select a place to install the condensing unit where is closest to the indoor unit. The maximum distance between indoor unit and outdoor unit can be different and is determined by models. Please only use clean refrigeration grade tubing. Do not make piping when it is wet or rainy. Do not uncap the tube ends until the final connections are ready. Burrs from cut ends of tubing must be taken away. To get rid of kinking, tube benders should be employed.

Use armaflex or equivalent to insulate suction pipes with a wall thickness of 3/8" at minimum. To get rid of sags which can trap oil, the tubing should be supported fully.

Maximum head drop (compressor above evaporator) depends on models. Use a "P" trap to trap risers every 10 feet. To reduce noise getting in the building, the tubing need to be isolated. Avoid harsh edges that could cut the tubes.

WARNING

Releasing refrigerant into the atmosphere is illegal. Adopt proper reclaiming methods and equipment when working on the refrigerant containing parts of the unit. Service should be carried out by a QUALIFIED service agency and certified technicians.

7. LEAKAGE TEST, EVACUATION & RELEASE OF REFRIGERANT

The condenser is sufficiently charged with R-410a for most matching evaporator units. Add charge for interconnecting tubing.

The service valve is shipped in the closed position and do not open it until completing whole connections and evacuation.

The suggested procedure of leakage test, evacuation, and discharge of refrigerant is listed below:

- Use high temperature brazing alloy to finish the ultimate piping connections between indoor and outdoor units.
- Attach a charging manifold to the service ports given at the service valves.
- Pressure the pipes and evaporator with nitrogen and carry out leakage check on all connections with soap bubbles. Repair as needed when there is defective joint. Make sure THE NITROGEN RELEASED FIRST. Re-test as necessary.
- Attach a vacuum pump to the manifold center connection, start the pump and turn on the manifold valves.
- Evacuate to 500 microns or less for at least of 30 minutes. Turn off the manifold valves and shut down the pump. Observe the vacuum reading and wait for15 minutes. Take a new vacuum reading. A reading of 800 microns or higher indicates the presence of moisture or a leak.
- Repair as necessary and repeat steps 3), 4)& 5).
- Confirm that manifold valves are turned off and the vacuum pump is disconnected.
- Take away the caps from the services valves. Open the valves to the fully ‘back-seat’ position. Replace service valve caps and tighten it up.

8. POWER-UP & INSPECTION

The operation of the unit is automatically controlled by the thermostat according to the setting by the user.

Notice!

Before turning on the unit, please install all panels properly, switch on the main power and connect the thermostat.

- Perform a system check by turning the thermostat system switch to "Off" and the fan switch to "Auto." Switch on the power supply breaker.
- Star the blower by turning the fan switch to “ON” .
- Turn the fan switch back to "Auto." The blower should be turned off. Turn the system switch to "Cool" and adjust the thermostat to the coldest setting.
- The evaporator fan, condenser fan and compressor should all be running, cooling will be provided after several minutes of operation.
- Proceed to the “FIELD CHARGING” section of these instructions.

9. CHARGING IN THE FIELD

The right system charge is important for maintain optimal unit performance, efficiency and service time. Please take time to get the right charge when installation. Operating conditions such as voltage, air flow, evaporator coil size, and indoor and outdoor temperature and humidity all could affect on the system pressures and superheat conditions.

All interconnection tubing and evaporator coils with thermostatic expansion valves must be properly charged. Additional charge maybe required depending on the length of refrigerant lines [See **Table 6**] .

Table 6

R=TX(L-25)ft

R(oz): Additional refrigerant to be charged
L(ft): The length of the liquid pipe
T(oz): The quantity of the charged refrigerant per additional foot

MODEL SIZE	12K	18K	24K	30K	36K	48K
oz/ft	0.16		0.32			

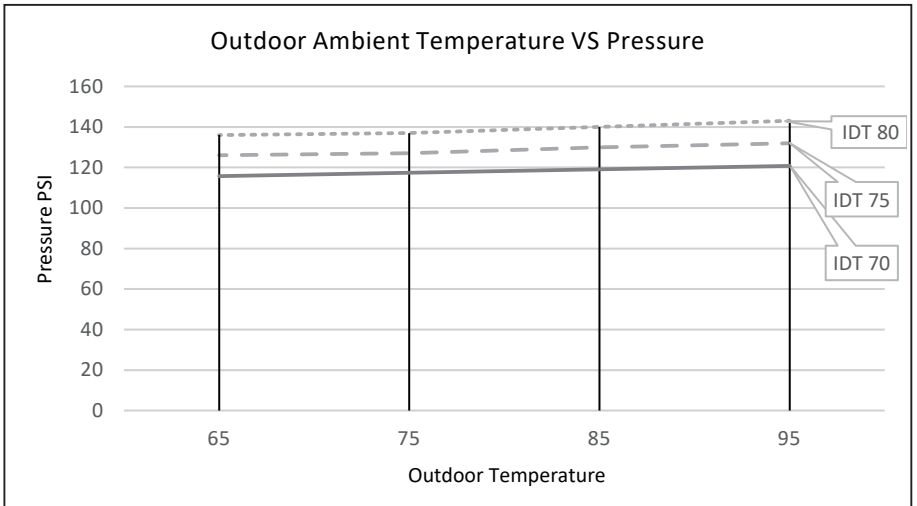
10. FINAL CHECKING

Please conduct a detail checking of the whole installation and clean it up.

Go through the operation of the unit with the homeowner/user.

Please refer to the pressure/temperature chart to ensure right performance level [See **Table 7**] .

Table 7



IDT \ ODT	65 ℉	75℉	85℉	95℉	
70℉	116	117	119	121	PSI
75℉	126	127	130	132	
80℉	136	137	140	143	

Note:
"IDT" = Indoor Temperature
"ODT" = Outdoor Temperature
1.Remove refrigerant, if the pressure is above the chart value.
2.Add refrigerant, if the pressure is below the chart value.

ComfortStar®

Design, material, performance specifications and components subject to change without notice.