QUIETSIDE

QUIETSIDE MINI SPLIT AIR CONDITIONERS

13 SEER

INSTALLATION & OPERATION MANUAL

Installation and Maintenance Manual

Report all Shipping Damage to Carrier IMMEDIATELY, Check units and box exterior for damage

Note to Installer

This manual to is to aid the qualified HVAC contractor in the Installation and Maintenance of this Quietside R410a Ductless Mini Split
Please read and understand these instructions prior to installing the unit, failure to comply with these instructions may result in improper installation, operation and maintenance, possibly resulting in fire, electrical shock, property damage, personal injury or death

Installers please retain this manual for future reference, please pass warranty registration to end user
If Technical Assistance is required during installation or start up, please visit our website at
www.quietside.com
or call 1-562-699-6066 or 717 243 2535 to speak to a Technical Service Assistant
When calling please have the Model numbers and Serial numbers available

Safety Instructions

⚠WARNING

Read all the Instructions, Install and apply the system per those instructions
Use the unit only in the manner described in this manual

1 Check Rating Plate for correct system voltage before installing the unit
Installing and operating a unit with the incorrect voltage may result in malfunction or other issues and **will void the warranty**

2 Units must be connected to a correctly grounded Electrical Supply

3 Do not use the units if they have been dropped or otherwise damage or installed incorrectly

The manufacturer of the unit will not be liable for any damages caused by failure to comply with the installation and operating instructions in this manual
The unit Rating Plate contains pertinent information to the unit operation, please refer to it as required

 **This symbol is an indication of Important Safety Information** 

⚠ DANGER

Completely read all Instructions prior to assembling installing, operating, or working on these units
Inspect all parts for damage prior to installation and start up
Units must be installed by a Qualified HVAC Contractor

Installation and Maintenance Manual

Installer Supplied Items

Refrigerant Line Set : Flare Connection only, suitable for R410A with both lines insulated, max length 45ft
Main System Breaker : Sized per unit requirements, to be mounted adjacent to Outdoor unit
High Voltage Interconnect Wiring : 14 AWG wiring from Outdoor unit to Indoor unit for Power and Control
Mounting Hardware : Wall Anchors, Condenser Pad etc
Refrigerant : R410A required for additional line set charge
Condensate Piping : Per local codes to remove condensate from the indoor unit

Items for Consideration

Application
Check the application of the unit prior to installation, certain applications require additional components or installation parameters

Computer or Data Server Rooms,
These require ballpark sizing of approximately 12,000 Btu/h Capacity per 250 SqFt of room size
The units will be running 24/7, so a Low Ambient Head Pressure Controller (See accessories), a Crankcase Heater and possibly a Wind Baffle (Field Supplied for cooling below 32 DegF) **must** be installed

Offices and Commercial Spaces, Churches etc
These require ballpark sizing of approximately 12,000 Btu/h Capacity per 400 SqFt of room size
The units could have the possibility of providing cooling with ambient's below 65 DegF, so a Low Ambient Head Pressure Controller (See accessories) is required as is a Crankcase Heater (field supplied)

Residential, Bedrooms, Family Rooms etc
These require ballpark sizing of approximately 12,000 Btu/h Capacity per 600 SqFt of room size
Low Ambient is typically not needed, unless a home office application is required.
Heat Pumps are a great application, however the units do not feature any back up resistance heat, so we do not recommend their use as a primary source of heat in areas where the winter temperatures fall below 25 DegF.

Installation
Determine the best location for mounting the Indoor unit, it must be located a minimum of 4 ft from the floor
Pay attention to the air circulation in the room, 9 & 12k units throw air 15ft, 18 & 24k units throw air 25ft, ensure no obstacles to airflow exist

Locate the Indoor and Outdoor units as close together as possible, maximum line set run and lift CANNOT BE EXCEEDED, then determine how the Interconnect piping, wiring and condensate hose is to be run

Unit	Max Line Set Run	Max Vertical Lift	Line Sizes
QSCE-09/12	50 Feet	20 Feet	1/4" & 1/2"
QSCE-18/24	50 Feet	20 Feet	3/8" & 5/8"
QSHE-09/12	50 Feet	20 Feet	1/4" & 1/2"
QSHE-18/24	50 Feet	20 Feet	3/8" & 5/8"

Ensure that all panels can be removed for service as required

Certification
All Quietside Ductless Mini Splits are certified by UL under UL standard 1995 in both Canada and the US
Performance is certified by our certification under the ARI 210/240 Program

Installation and Maintenance Manual

Controls and Components

Units are supplied with a wireless remote controller, which communicates with the unit Microprocessor controller
The return air temperature sensor mounted on the unit then controls the unit operation
Several modes of operation are available to the end user depending on the type of comfort required
All unit operating functions are controlled via the remote controller
Unit operating modes are :

Optional Controls and Components

Low Ambient Controller : ICM 326H must be used in Data Room or Commercial applications
For a wiring diagram please contact Quietside or follow general diagram supplied with ICM Controller
Probe must be located in the fin pack or on a return bend that measures approx 100 DegF during normal operation

Condensate Pump : Field Installed Mini Pump, Quietside recommend the Aspen brand of Condensate Pump, follow their wiring diagram recommendations. This pump is installed externally to the unit

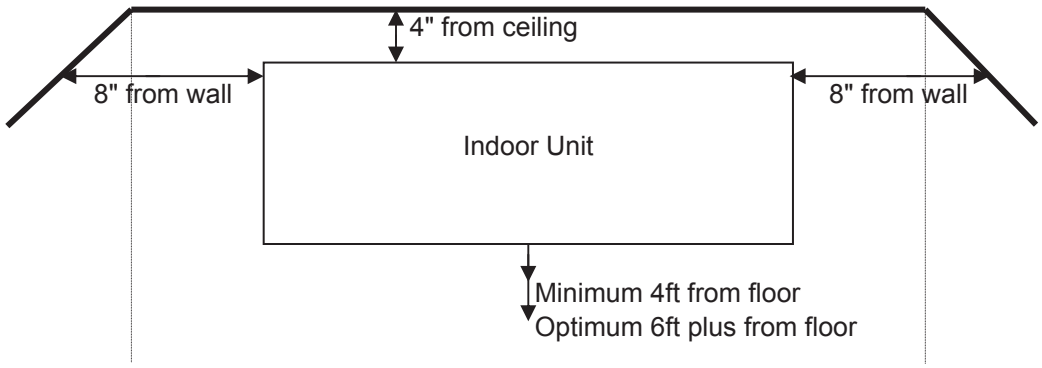
Unit Installation

⚠ CAUTION

Follow Instructions, failure to follow instructions may cause possible malfunction and void any warranty

Step 1
Remove Indoor and Outdoor units from the carton/box
Indoor unit carton contains Remote Control and Batteries, ensure these are kept in a safe place during installation

Step 2
Locate area to Install Indoor unit
Indoor unit must be located a minimum of 4ft from the floor and 6" from the ceiling
Choose an area where the wall is plumb and determine how to best to run the unit interconnects



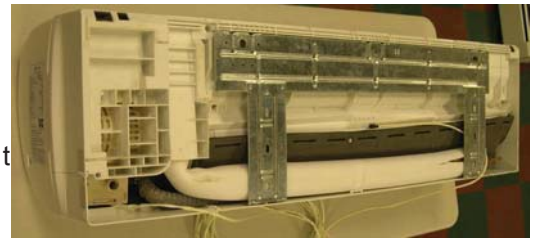
Ensure no obstacles to Airflow are directly in front of the unit, for a minimum of 12ft for 9/12,000 Btu/h units and 16ft for 18/24,000 Btu/h units
Do not install the Indoor unit units in areas exposed to high humidity (RH of 80% plus), direct sunlight and direct heat from stoves or other devices

Installation and Maintenance Manual

Unit Installation (Cont)

Step3

Drill Hole for Line Set etc



Remove mounting bracket from the rear of the Indoor unit,
use a Phillips head screwdriver to remove the unit pipe strap, and if unit is a heat pump the defrost sensor also must be undone from its retainer. If mounting the unit on an outside wall measure from the edges of the unit to the center of the line set stub 90° bend to locate t the center of the wall penetration. Drill a ø 3" hole through the wall
Angle the wall penetration slightly down towards the outside to assist in draining the condensate away from the unit
If mounting the unit on an inside wall, use the knockouts provided on the LHS and RHS of the unit to route the piping and wiring connections through

Step 4

Install Mounting Bracket

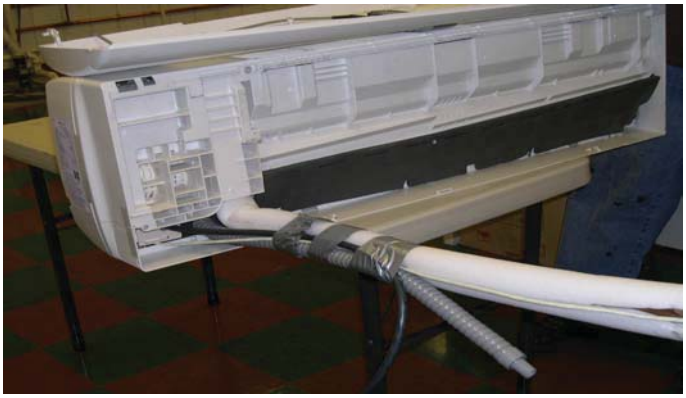
Locate and secure the mounting bracket to the wall, the Indoor unit weighs a maximum of 20Lbs, use wall anchors and mount to a wall stud to ensure that the wall is capable of holding the weight of the unit
Use a level to ensure mounting bracket is leveled, so condensate can drain properly

Step 5

Prepare Unit Line Set Connections

Rotate refrigerant line stubs set gently through 90° (if mounting on an outside wall), for other line set configurations align the stubs as required
Tip : Use Duct tape to tape the Condensate hose (make sure it is below the Line set stubs) and the Defrost Sensor (Heat Pump Only), this makes it easier to guide them though the hole drilled in the wall
Also if possible feed the 14 AWG Interconnect wiring between Indoor and Outdoor (Maximum # of wires required is 6) through the unit electrical connection (if required by local codes an electrical connector can be attached to the rear of the unit). Tape the loose wire to the line set stubs.
These two tips save time and prevent damage to the stubs when mounting the Indoor unit

Note :
Condensate hose is taped below line set stubs
Wrap Duct tape to the end of the condensate hose for easier installation



Installation and Maintenance Manual

Unit Installation (Cont)

Step 6

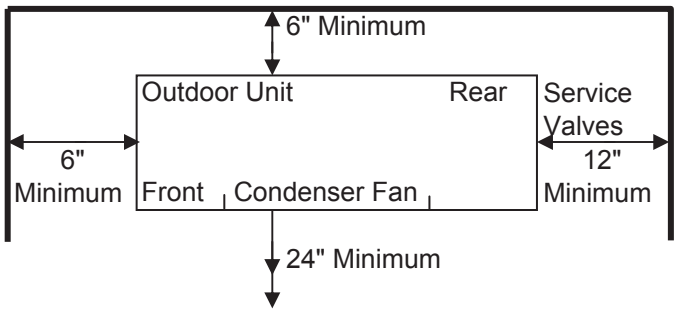
Install unit on Mounting Bracket

Feed the line set stubs/condensate hose/wiring connections through the ø 3" hole, then locate the unit key slots onto the tabs on top of the mounting bracket. Bottom of the unit then latches onto the mounting bracket. Indoor unit is now installed, it should be plumb, level and flush with the wall. If it is not check that the line set stubs are completely through the wall penetration, and also that the wall is plumb

Step 7

Locate Outdoor unit

Clearances for the Outdoor unit are :



Install the Outdoor unit on a Condenser Pad or if a Heat Pump use feet to raise unit up approx 6" to allow for defrost to drain away

Do not install the Outdoor unit in a location exposed to high winds (field fabricated and installed wind baffle may be required).

Ensure location does not impede access around unit and pose a disturbance to neighboring areas

Step 8

Refrigerant Line Set Piping

Interconnecting line set between the Outdoor unit and the Indoor unit, must have both refrigerant lines insulated as condensing device is located in the Outdoor unit

Gently bend the line set stubs from the Indoor unit to the desired location

Using 2 x 10"/12" Crescent wrenches remove the flare nuts from the Indoor unit line stubs. Unit is filled with a dry gas, check for release of this to ensure that no leaks are present

Use a small amount of vacuum pump oil on the male flare threads to ease installation. Connect the line set to the stubs. Using the 2 wrenches, 1 on the male & 1 on the female tighten the flare nuts

DO NOT INSTALL A LIQUID LINE SIGHT GLASS OR FILTER DRIER IN THE SYSTEM

Run the line set to the Outdoor unit, avoid tight bends and kinking the lines. Quietside does not recommend brazing line sets together or to the unit connections

If line set length is in excess of that required, cut line set and re-flare or coil excess vertically to facilitate oil return to the compressor

Installing the Line Set on the Indoor unit stubs

Installation and Maintenance Manual

Unit Installation (Cont)

Step 9
Evacuation
Gauges can now be attached to the service ports -
SERVICE PORTS HAVE A 5/16" CONNECTION TO GAUGES, WHICH IS DIFFERENT TO THE NORM
Once the gauges are attached the line set can be leak checked using Nitrogen at 300 Psig
Evacuate the unit down to a minimum of 200 Microns, break vacuum with Nitrogen to further leak check
Re-evacuate the system down to 200 Microns or lower
This is an R410A System it is essential that a deep vacuum be pulled on the system to remove all traces of moisture

Step 10
Main Power Wiring

⚠ DANGER Electrical Wiring should be done in accordance with all National Electrical Code (NEC) and local state/city building codes

Tip : Small Electrical Screwdriver is required for unit terminals
Breaker size and wiring must be sized for the rating plate amperage, MCA and MOP
If a smaller than required breaker is used possibility of unit damage etc could occur
Use only HACR type breakers, each system installed must have a separate branch circuit with an individual breaker/fuse

	QSCE-09	QSCE-12	QSCE-18	QSCE-24
Breaker Size	15A	15A	20A	25A
RLA	6.7A	8.8A	5.3A	8.6A
MCA	8.2A	10.8A	6.5A	10.6A

	QSHE-09	QSHE-12	QSHE-18	QSHE-24
Breaker Size	15A	15A	20A	25A
RLA	6.9A	9.0A	5.5A	8.6A
MCA	8.4A	11.0A	6.8A	10.6A

A local disconnect should be installed adjacent to the Outdoor unit in accordance with National and Local Codes
The Outdoor unit provides power for the Indoor unit, no disconnect is required between the Outdoor and Indoor units
Line voltage from the disconnect should be wired to N - L (115V Unit)
L1 - L2 (208/230V Unit)
Remove RHS Knockout on the terminal access panel for whip/wiring connection
Ground connection must be made to the terminal plate

Tip : For easier access to the Terminals in the Outdoor unit remove the lower access panel to install whip and sealtite connectors for conduit

Local Disconnect
and Whip Connected

Heat Pump unit terminals
L1 - L2 : Power from Breaker
L3 - L4 : Power to Indoor unit
1 - 2 - 3 : Control Signals

Installation and Maintenance Manual

Unit Installation (Cont)

Step 11
Controls Wiring

⚠ DANGER

Electrical Wiring should be done in accordance with all National Electrical Code (NEC) and local state/city building codes

ALL CONTROLS WIRING BETWEEN INDOOR AND OUTDOOR UNIT IS HIGH VOLTAGE
MINIMUM 14 AWG WIRE MUST BE USED
Remove terminal covers from Indoor unit and wire to the terminals, small electrical screwdriver required
Control wiring from the Outdoor Unit must be a point to point i.e. the terminal that the wire is attached to on the Outdoor unit must be the same terminal it is wired to in on the Indoor unit

This is extremely important : Switching the L3 - L4 or N1 - L1 wires over will allow the Indoor unit to operate but it will not provide controls signals for the Outdoor unit so that the compressor will not operate
Ground connection should be made to ground screw marked in Indoor unit

If unit is a Heat Pump Defrost Sensor must be connected from the Indoor unit to the Defrost Sensor in the Outdoor unit. Standard lead length is 25ft, if a longer length is required then cut the lead and extend using thermostat wire

Control Wiring at Outdoor unit (Heat Pump unit shown)
Note use of colored wire (supplied with Line Set) and defrost sensor connected (Heat Pump only)

Ground wires connected to the terminal plate
Indoor and Outdoor units must be grounded

Step 12
Condensate Hose

⚠ CAUTION

Unit is provided with approximately 18" of Condensate Hose
Hose connection is sized to accept a 3/4" OD or 5/8" ID Clear Plastic Hose to then extend to building drain
All condensate hose extensions should be in accordance with local building codes
Remember water only flows downhill to ensure positive draining from the unit
Check using water for a positive flow of Condensate

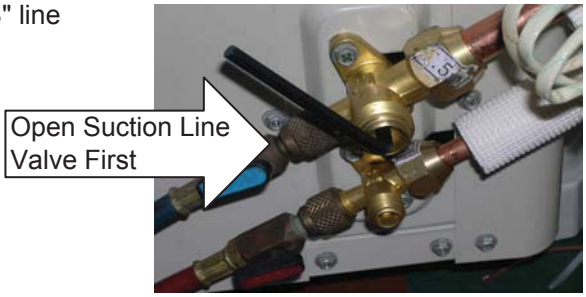
The basic system installation is now complete
The unit is now ready for start up -
Use this time to ensure that worksite is tidy. Quietside recommend the use of Slimduct products to hide the refrigerant line set interconnects - available from your Quietside distributor

Installation and Maintenance Manual

Unit Start Up

With the refrigerant system completely evacuated the system can now be opened to allow the refrigerant charge in the Outdoor unit to be released into the line set

The Service Valves require a 6mm and a 5mm Allen wrench respectively to undo the valve stems
Remove the BRASS caps from the Service Valves
Open the SUCTION line Valve first to prevent any possible oil logging of the Capillary tube
This can occur if the liquid line valve is opened first with the rest of the system in a deep vacuum
Then open the "LIQUID or EXPANDED GAS" line



Unscrew both valve stems until they come to a stop against the valve body, replace the Brass Caps and then tighten the caps to prevent leaks

Energize the breaker to allow system to be powered

Start Indoor unit, Cooling mode is only allowed when the Outside Ambient Temperature is above 65 DegF to prevent damage to the compressor
Unit has a 3 minute time delay for the compressor start up operation

Unit is charged with enough R410A refrigerant for a line set of 25ft length
For longer line set lengths additional charge must be WEIGHED in per the following table

	Added Charge required for a line set of			
Unit	30ft	35ft	40ft	45ft
QSCE-09 & 12	1.5oz	3.0oz	4.5oz	6.0oz
QSCE-18 & 24	2.5oz	5.0oz	7.5oz	10.0oz
QSHE-09 & 12	1.5oz	3.0oz	4.5oz	6.0oz
QSHE-18 & 24	2.5oz	5.0oz	7.5oz	10.0oz

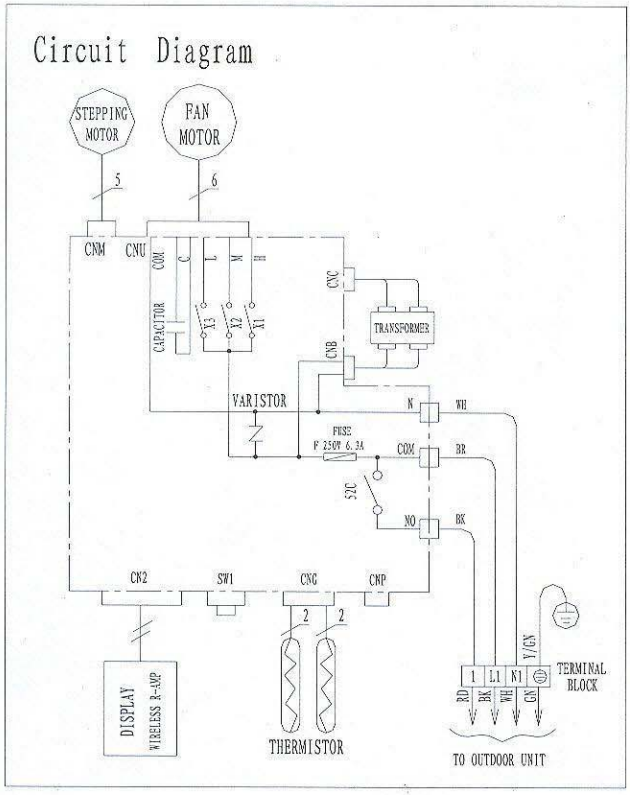
Standard Operation of the unit - Cooling
Indoor Temperature Split 30 DegF
Suction Pressure 115 Psig, approx 37 DegF
Suction Line Temperature 45 DegF
Schraeder connection on the "Liquid" line DOES NOT READ HEAD PRESSURE - it is an expanded gas pressure

Standard Operation of the unit - Heat Pump
Indoor Temperature Split 30 DegF
High Side Pressure 400 Psig, approx 117 DegF
(Measured at Liquid Line Schraeder)
Discharge (Liquid) Line Temperature 130 DegF

Installation and Maintenance Manual

Wiring Diagrams

QSCE 091 & 121



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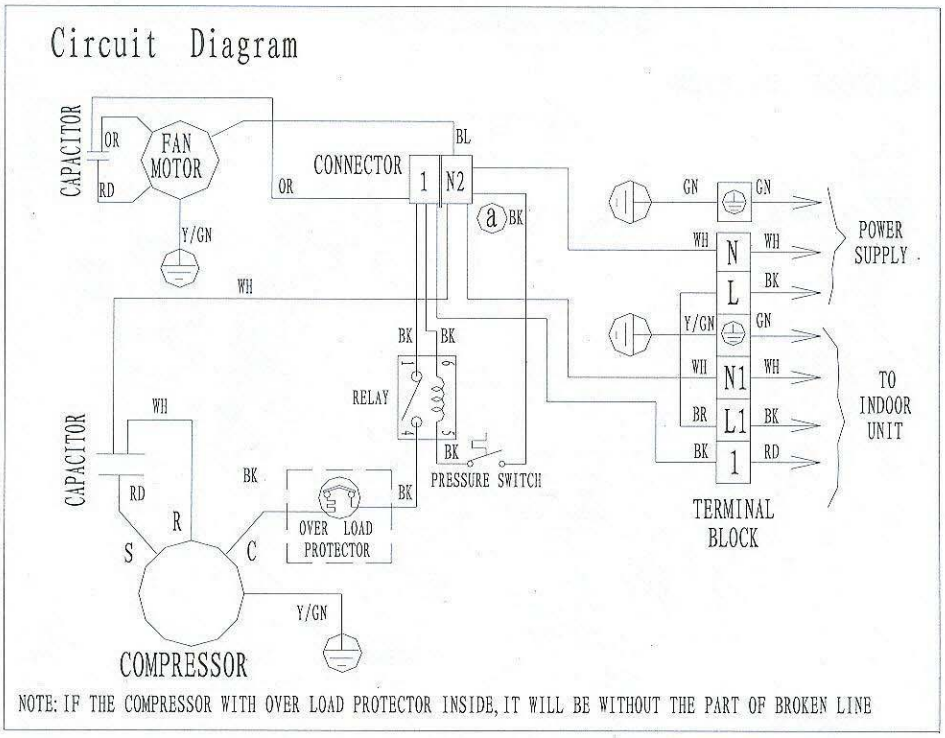
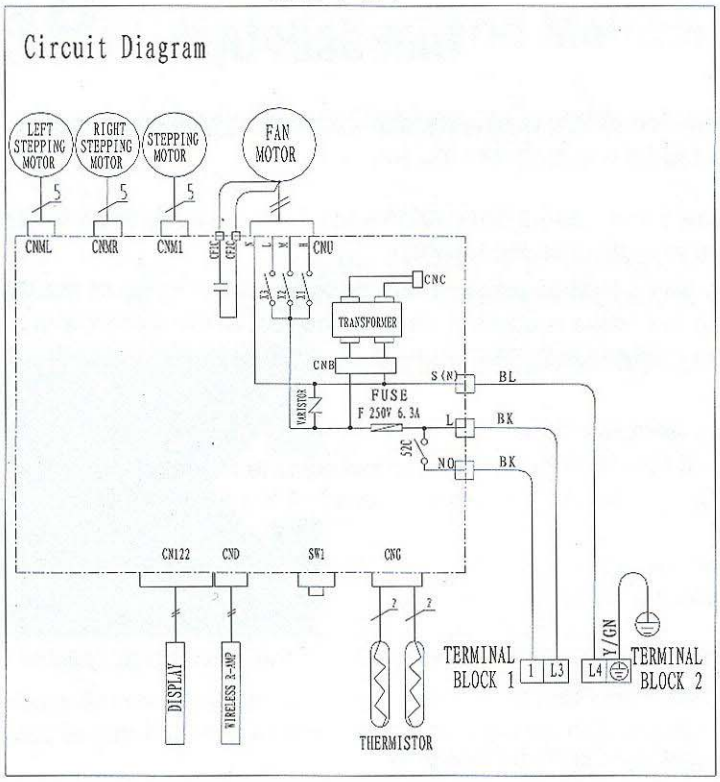


QSCE 181



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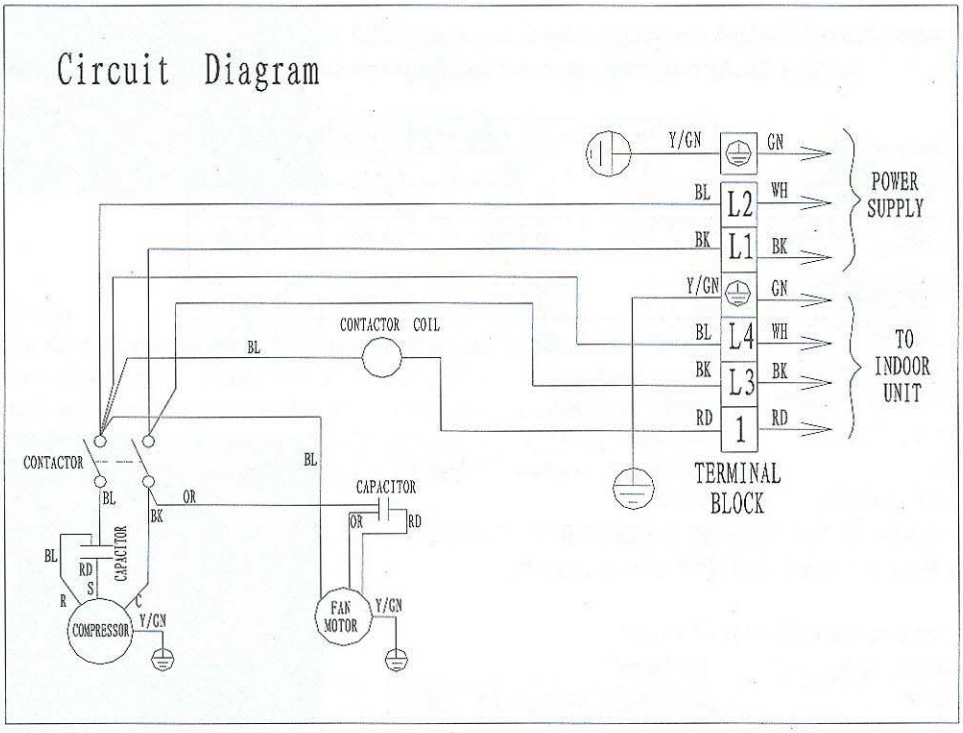

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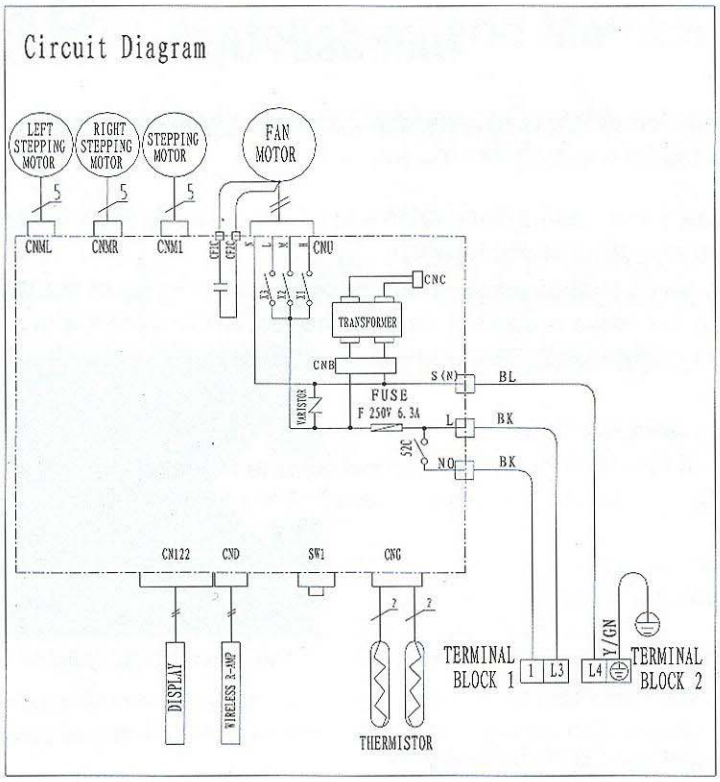

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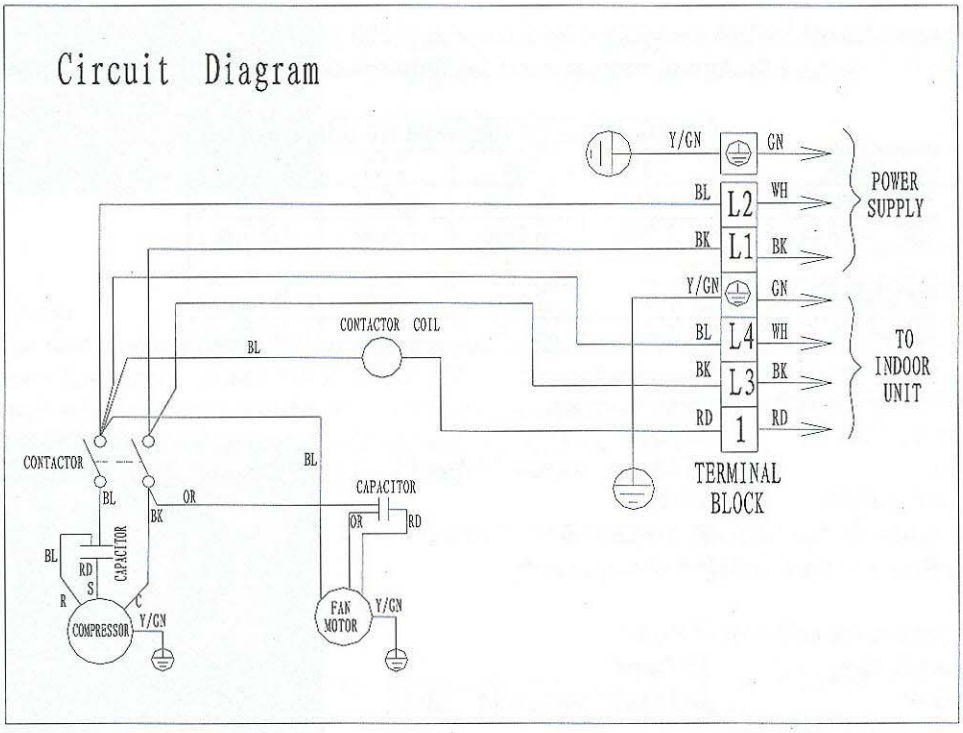
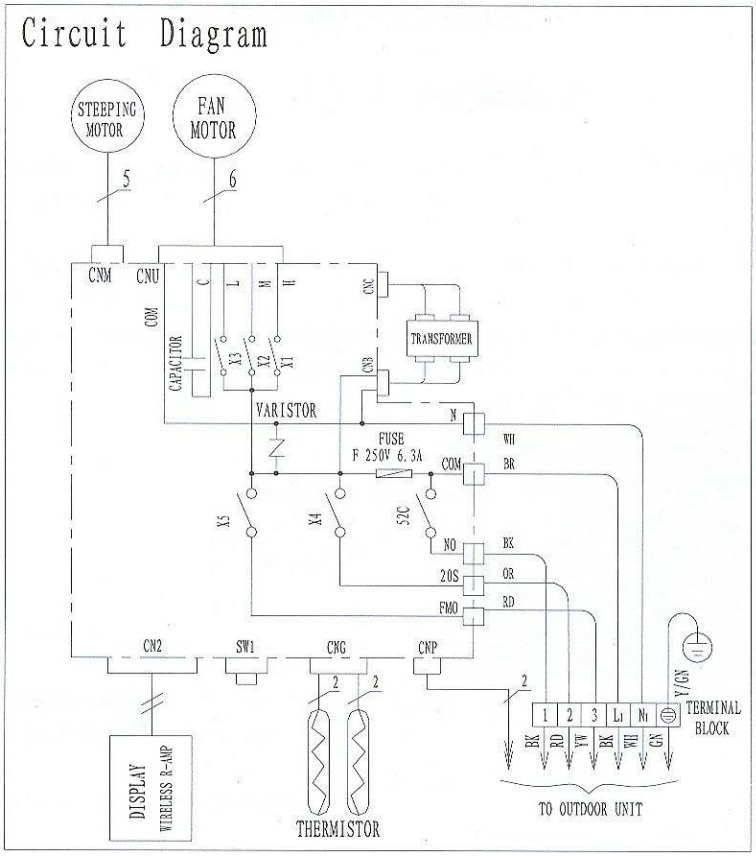


QSHE 091 & 121



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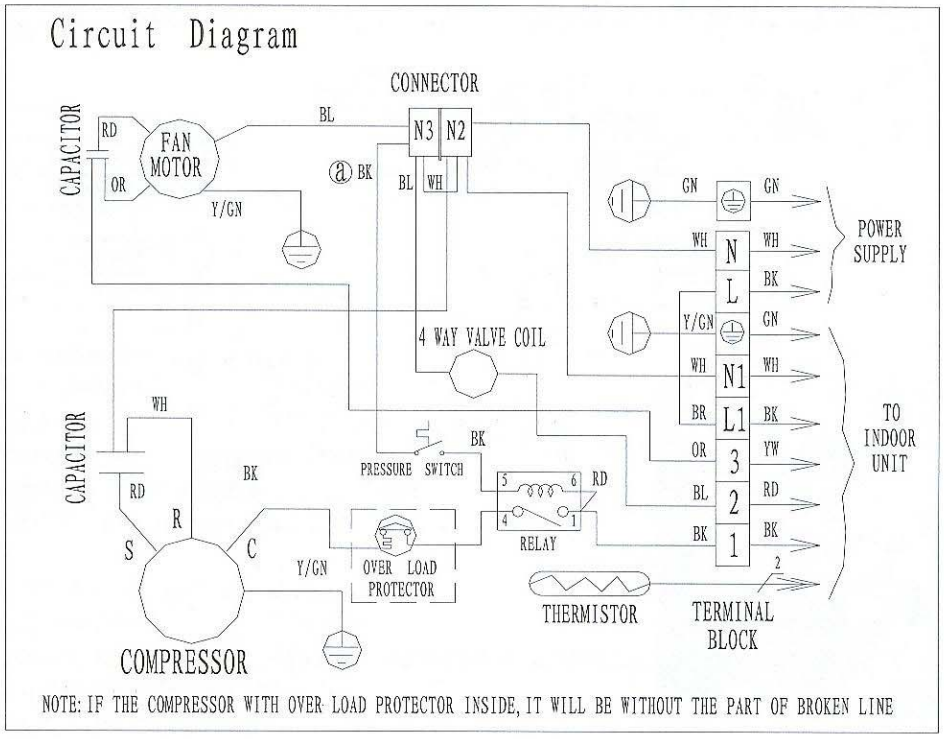

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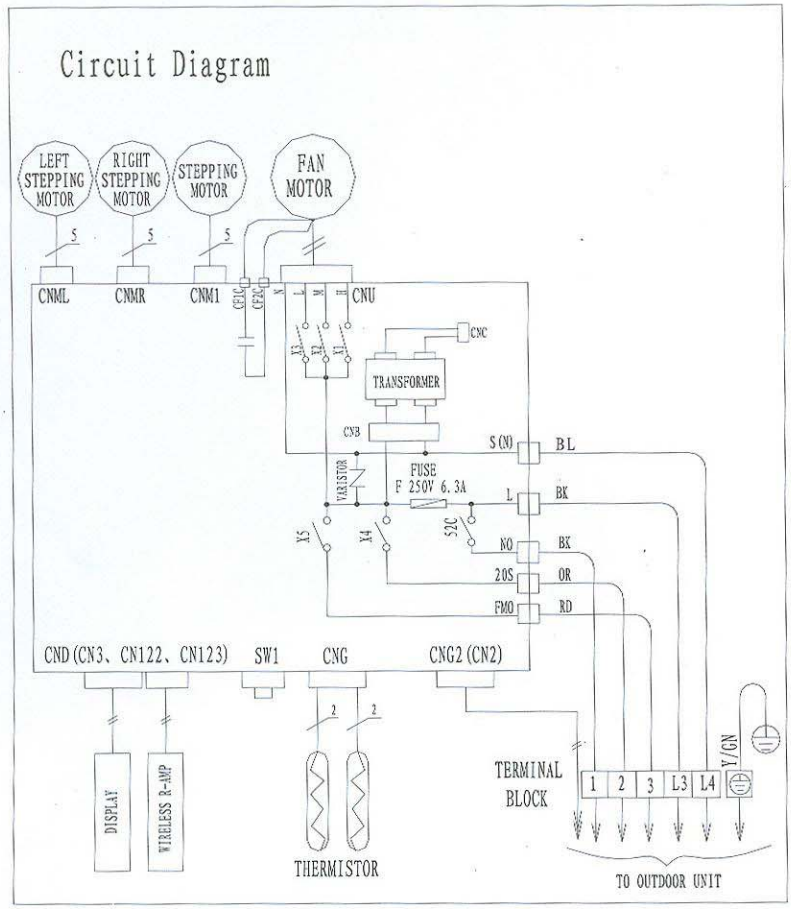

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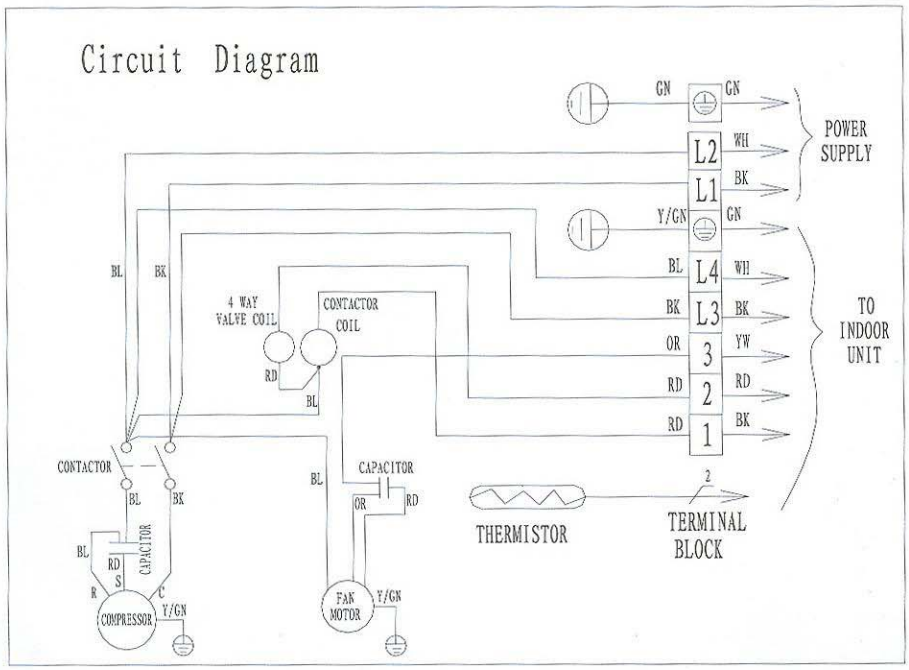

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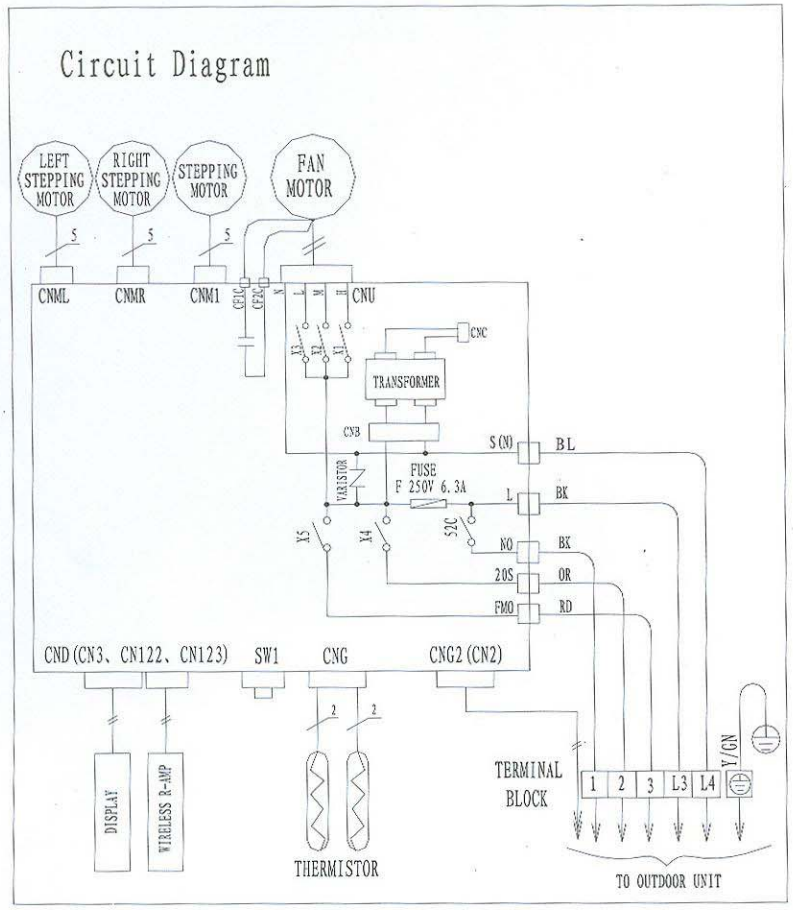

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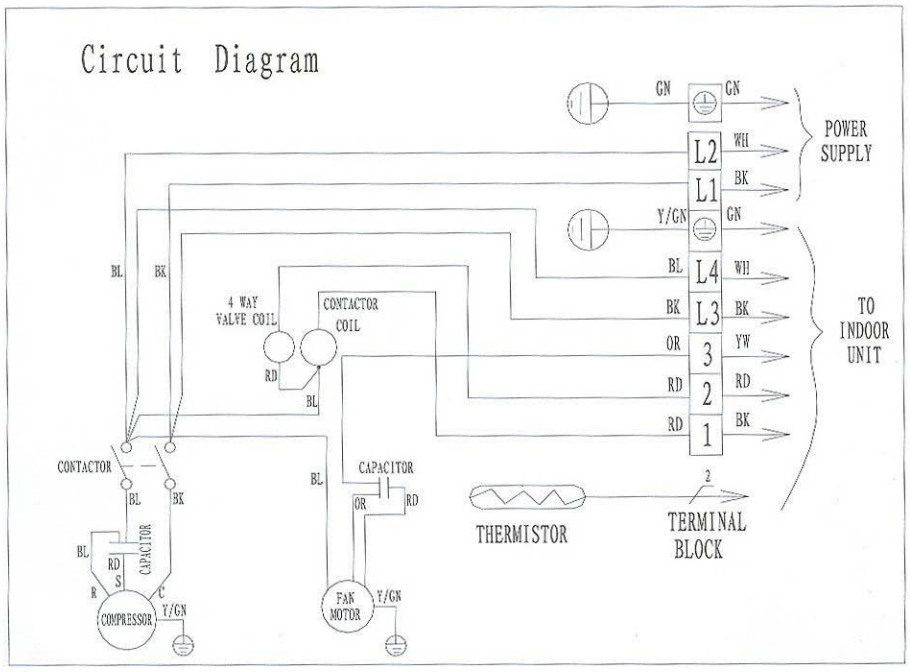

Unit Fault Codes

The units have a self diagnostic capability should certain faults occur with the system. The Indoor unit will blink the run light a certain number of times to signify which fault has occurred

These faults are :

E1 - One Blink Unit is running in the Warm Start mode
E2 - Two Blinks Room Temperature Sensor Error
E3 - Three Blinks Coil Temperature Sensor Error
E4 - Four Blinks Outdoor unit Error
E5 - Five Blinks Freeze Protection Mode
Six Blinks N/A
E7 - Seven Blinks Outdoor Temperature Sensor Error – Heat Pumps only
A constant blinking light indicates that the unit is running in the Defrost mode

Warm Start Mode = 1 Blink (E1)

This allows the Indoor coil to heat up on initial start of Heat Pump heating, Indoor fan will not operate until the coil temperature is 98 DegF

Room Temperature Sensor Error = 2 Blinks (E2)

Reason - If the Room Temperature sensor mounted on the front of the Indoor coil, either shorts out or the resistance value goes to infinity the unit will recognize this and shut down

Remedy – Check sensor using a multi meter, if outside resistance range or shorted replace the sensor. If within normal range/not shorted replace PCB. This is the same thermistor as the Room Temperature and Heat Pump defrost temperature sensor.

Temperature Resistance
50 DegF 8800 Ω
60 DegF 7100 Ω
70 DegF 5750 Ω
80 DegF 4650 Ω
90 DegF 3800 Ω

Coil Temperature Sensor Error = 3 Blinks (E3)

Reason - If the Coil Temperature sensor mounted in a well on the RHS of the Indoor coil, either shorts out or the resistance value goes to infinity the unit will recognize this and shut down

Remedy – Check sensor using a multi meter, if outside resistance range or shorted replace the sensor. If within normal range/not shorted replace PCB. This is the same thermistor as the Room Temperature and Heat Pump defrost temperature sensor.

Temperature Resistance
20 DegF 17800 Ω
30 DegF 13800 Ω
40 DegF 11000 Ω
50 DegF 8800 Ω

Outdoor Unit Error = 4 Blinks (E4)
When the unit operates it continuously measures the Indoor coil temperature.
If after 5 minutes of compressor operation the Indoor coil temperature is not below 77 DegF (5000Ω) for cooling operation, or above 86 DegF (4200Ω) in Heat Pump operation, the unit will display the 4 blinks.
The unit will then operate for another 20 minutes with the error code blinking, if the Indoor coil temperature has still not fallen/risen below/above the requirements then the controller will shut down the unit
This error code can have several causes
Compressor problem – locked or other mechanical/electrical problem with the compressor – check the OLP located on top of the compressor, it should be normally closed, open circuit if the compressor is overheating or drawing locked rotor amperage.
Check the compressor run capacitor, Quietside units do not use starting capacitors, in areas of low mains voltage a start component, e.g. “Kickstart” may be a good idea especially in a commercial application where multiple starts are often required.
Refrigerant Loss or flow restriction – Check for a leak, if a leak is found, repair, evacuate and recharge to the nameplate charge, adding additional refrigerant if the line set is greater than 25ft.
Check for a restriction in the system. The capillary tube expansion device(s) are located in the Outdoor unit.
Check for clogged Filters, Indoor Fan or Coils – Ensure all parts are clean and free of debris

Freeze Protection Mode = 5 Blinks (E5)
If the Indoor coil temperature sensor reads a temperature of 32 DegF (13300Ω), and the compressor has been running continuously for 10 minutes, the Compressor and the Outdoor fan will shut down, and the Indoor fan speed will be set to low.
When the Indoor coil temperature rises to 45 DegF (9900Ω), and the compressor has been off for a minimum of 3 minutes, the compressor and the Outdoor fan will restart.
If the Indoor coil temperature sensor reads a temperature of 5 DegF (25600Ω), and the compressor has been running for 3 minutes continuously, the Compressor, Outdoor fan, Indoor fan and the Air Vane will be shut down.
The unit will be restarted after a 6 minute off period, if the coil temperature sensor again senses a temperature of 5 DegF within a six minute period the unit will again shut down and the unit will indicate that it is in the Freeze Protection mode.
Check Refrigerant charge, Indoor Fan & Filters, is unit cooling below 65 DegF Ambient?

Defrost Temperature Sensor = 7 Blinks (E7)
On Heat Pump systems there is a sensor in the Outdoor Coil which measures the temperature of that coil. It is connected via the factory supplied (or field supplied) 18 AWG to the Indoor unit. If the sensor shorts out or the resistance is out of range or if it is not connected to the Indoor unit, it will display the error code when turned into the Heat Pump mode.
The system can operated in the cooling mode without the sensor being connected, however if the heating mode is selected the unit will display the error code.
Temperature Resistance

20 DegF 17800 Ω
30 DegF 13800 Ω
40 DegF 11000 Ω
50 DegF 8800 Ω
60 DegF 7100 Ω
70 DegF 5750 Ω
80 DegF 4650 Ω
90 DegF 3800 Ω

The sensor uses a 2 pin electrical connector, check this to ensure that the electrical connection is made correctly.

Pull apart the connector and check on the wire from the Indoor unit, the voltage provided from the Indoor Microprocessor to the sensor, it should be 5VDC. If no voltage is found the Indoor PCB is faulty.