

# Installation and Maintenance Instructions

## CONTENTS

	Page
<b>SAFETY CONSIDERATIONS</b> .....	1,2
<b>GENERAL</b> .....	2-4
<b>INSTALLATION</b> .....	5-12
<b>Step 1 — Unpack and Inspect Units</b> .....	5
• PROTECTING UNITS FROM DAMAGE	
• PREPARING JOBSITE FOR UNIT INSTALLATION	
• IDENTIFYING AND PREPARING UNITS	
<b>Step 2 — Position the Unit</b> .....	5
<b>Step 3 — Connect Refrigerant Piping and Wiring</b> .....	6
• INSULATION	
• PIPING CONNECTIONS BETWEEN OUTDOOR AND INDOOR UNITS	
<b>Step 4 — Pressure and Vacuum Test System</b> .....	8
<b>Step 5 — Complete Electrical Connections</b> .....	9
• POWER SUPPLY	
• POWER WIRING	
• CONTROL CONNECTIONS	
<b>START-UP</b> .....	13
<b>Pre-Start Check</b> .....	13
<b>System Operation Check</b> .....	13
<b>MAINTENANCE</b> .....	13
<b>TROUBLESHOOTING</b> .....	13-16
<b>Replacement Parts</b> .....	16

## SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury or property damage. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes and the current editions of the National Electrical Code (NEC) ANSI/NFPA (American National Standards Institute/National Fire Protection Association) 70. In Canada, refer to the current editions of the Canadian Electrical Code CSA (Canadian Standards Association) C22.1.

Understand the signal words — DANGER, WARNING, and CAUTION. DANGER identifies the most serious hazards which will result in severe personal injury or death. WARNING signifies hazards that could result in personal injury or death. CAUTION is used to identify unsafe practices, which would result in minor personal injury or product and property damage.

Recognize safety information. This is the safety-alert symbol (⚠). When this symbol is displayed on the unit and in instructions or manuals, be alert to the potential for personal injury. Installing, starting up, and servicing equipment can be hazardous due to system pressure, electrical components, and equipment location.

### ⚠ WARNING

Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

### ⚠ WARNING

When installing the equipment in a small space, provide adequate measures to avoid refrigerant concentration exceeding safety limits due to refrigerant leak. In case of refrigerant leak during installation, ventilate the space immediately. Failure to follow this procedure may lead to personal injury.

### ⚠ WARNING

DO NOT USE TORCH to remove any component. System contains oil and refrigerant under pressure.

To remove a component, wear protective gloves and goggles and proceed as follows:

- Shut off electrical power to unit.
- Recover refrigerant to relieve all pressure from system using both high-pressure and low pressure ports.
- Traces of vapor should be displaced with nitrogen and the work area should be well ventilated. Refrigerant in contact with an open flame produces toxic gases.
- Cut component connection tubing with tubing cutter and remove component from unit. Use a pan to catch any oil that may come out of the lines and as a gage for how much oil to add to the system.
- Carefully unsweat remaining tubing stubs when necessary. Oil can ignite when exposed to torch flame.

Failure to follow these procedures may result in personal injury or death.

**⚠ CAUTION**

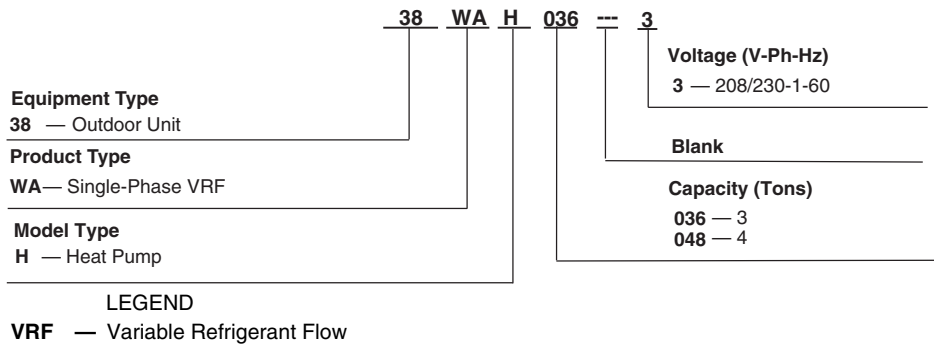
DO NOT re-use compressor oil or any oil that has been exposed to the atmosphere. Dispose of oil per local codes and regulations. DO NOT leave refrigerant system open to air any longer than the actual time required to service the equipment. Seal circuits being serviced and charge with dry nitrogen to prevent oil contamination when timely repairs cannot be completed. Failure to follow these procedures may result in damage to equipment. For information about replacement oil type and viscosity, see Table 1.

**GENERAL**

The single-phase VRF (variable refrigerant flow) heat pump system offers a variety of indoor unit types and sizes, ranging from 0.5 to 4 tons. The 38WAH outdoor units are available in two capacities, 3 and 4 tons, to accommodate the number of indoor units in the system. The system has capability to operate between 50% and 130% connected capacity, allowing the system to be tailored to the needs of the customer and the application.

The equipment is initially protected under the manufacturer's standard warranty; however, the warranty is provided under the condition that the steps outlined in this manual for initial inspection, proper installation, regular periodic maintenance, and everyday operation of the unit be followed in detail. This manual should be fully reviewed in advance before initial installation, start-up and any maintenance. Contact your local sales representative or the factory with any questions BEFORE proceeding.

See Fig. 1 for model number nomenclature. Table 1 lists physical data for each unit size. Figure 2 shows unit dimensions.



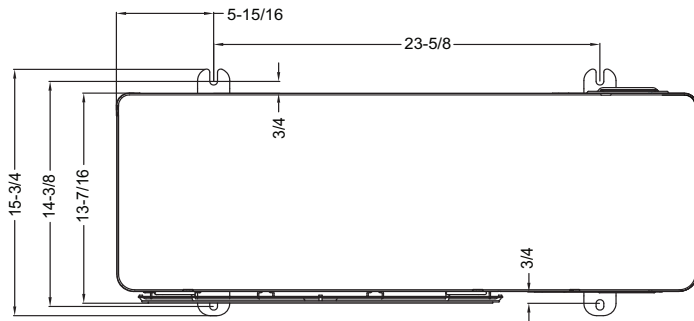
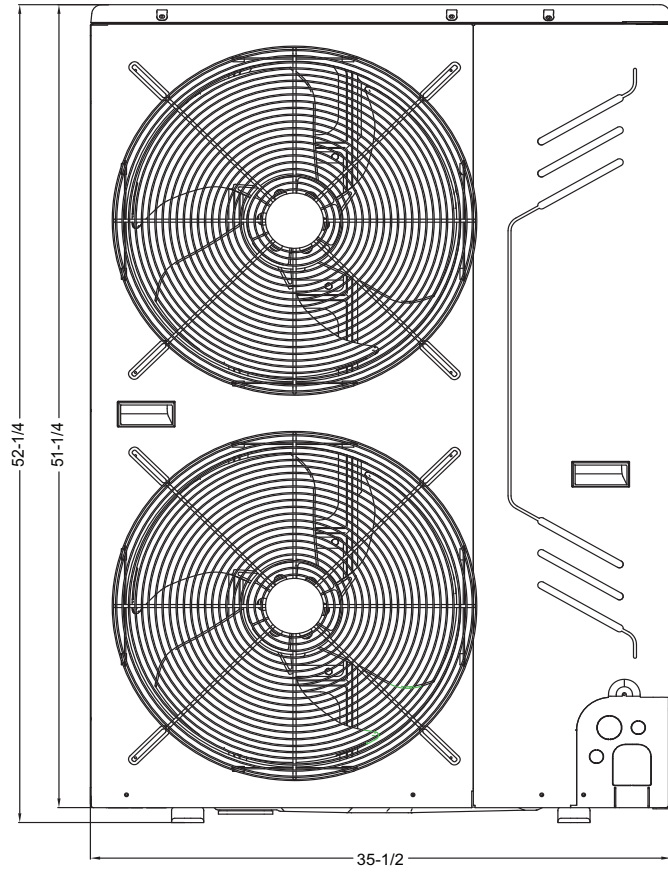
**Fig. 1 — Model Number Nomenclature**

**Table 1 — 38WAH Physical Data**

UNIT 38WAH	036	048
POWER SUPPLY (V-Ph-Hz)	208/230-1-60	
COOLING CAPACITY (Btuh)	36,000	47,500
HEATING CAPACITY (Btuh)	40,000	52,500
MINIMUM CIRCUIT AMPS	25	31
COMPRESSOR	Rotary	
Type	Rotary	
Number	1	
Rated Current, RLA (A)	18.5	22.8
Crankcase (W)	25	
Refrigerant Oil Type/Viscosity Index	FV50S/84	
Refrigerant Oil (oz.)	50.6	
OUTDOOR FAN MOTOR	DC Motor	
Type	DC Motor	
Insulation Class	E	
Rated Current (A)	2 x 0.9	
Speed (RPM)	800	
OUTDOOR FAN	ASG20	
Material	ASG20	
Type	Axial Fan	
Air Flow (cfm)	4,200	
Diameter (in.)	20	
Height (in.)	6 11/16	
OUTDOOR COIL	2	
Number of Rows	2	
Fin Spacing (fins/in.)	16	
Fin Type	Aluminum with Hydrophilic Coating	
Tube Diameter, OD (in.)	5/16	
Tube Type	Copper Tube with Inner Groove	
Number of Circuits	7	
SOUND DATA, HIGH SPEED (dBA)	58	58
UNIT DIMENSIONS W x H x D (in.)	35 1/2 x 52 1/4 x 15 3/4	
PACKING DIMENSIONS W x H x D (in.)	40 9/16 x 57 5/16 x 17 1/8	
NET/GROSS WEIGHT (lb)	209/234	
REFRIGERANT	R-410A	
Type	R-410A	
Charge Volume (lb)	7.3	8.6
EXPANSION DEVICE	EXV	
DESIGN PRESSURE, High/Low (psig)	650/250	
REFRIGERANT PIPING (in.)	3/8	
Liquid Side, OD	3/8	
Suction Side, OD	5/8	
Total Pipe Length (ft)	≤ 328	
Longest Pipe Length, Actual (ft)	148	
Maximum Elevation Differential between Indoor Units (ft)	≤ 26	
CONNECTING WIRING (AWG)	Sized per NEC and Local Codes Based on Nameplate Electrical Data	
Power Wiring	3 x 8 AWG	3 x 6 AWG
Signal Wiring	3-Core Shielded Wire x 20 AWG	
COOLING AMBIENT TEMPERATURE (°F)	5 to 118.4	
HEATING AMBIENT TEMPERATURE (°F)	-4 to 80.6	
TOTAL CONNECTED CAPACITY (%)	50 to 130	
MAXIMUM NUMBER OF INDOOR UNITS TO BE CONNECTED	5	7

LEGEND

- AWG** — American Wire Gage
- EXV** — Electronic Expansion Valve
- NEC** — National Electrical Code
- RLA** — Rated Load Amps



NOTE: All dimensions shown in inches.

**Fig. 2 — 38WAH036,048 Dimensions**

## INSTALLATION

**Step 1 — Unpack and Inspect Units** — Units are packaged for shipment to avoid damage during normal transit and handling. It is the receiving party's responsibility to inspect the equipment upon arrival. Any obvious damage to the carton and/or its contents should be reported on the bill of lading and a claim should be filed with the transportation company and the factory. Unit should always be stored in a dry place, and in the proper orientation as marked on the carton.

### CAUTION

To avoid equipment damage, do not lift unit by the drain pipe or refrigerant piping. Unit should be lifted using the mounting brackets.

After determining the condition of the carton exterior, carefully remove each unit from the carton and inspect for hidden damage. Check to make sure that items such as thermostats, controller etc. are accounted for whether packaged separately or shipped at a later date. Any hidden damage should be recorded, a claim should be filed with the transportation company, and the factory should be notified. In the event a claim for shipping damage is filed, the unit, shipping carton, and all packing must be retained for physical inspection by the transportation company. All units should be stored in the factory shipping carton with internal packaging in place until installation.

**PROTECTING UNITS FROM DAMAGE** — Do not apply force or pressure to the coil, piping, or drain stub-outs during handling. All units should be handled by the chassis or as close as possible to the unit mounting point locations.

The unit must always be properly supported. Temporary supports used during installation or service must be adequate to hold the unit securely. To maintain warranty, protect units against hostile environments (such as rain, snow or extreme temperature), theft, vandalism, and debris on jobsite. Do not allow foreign material to fall into drain pan. Prevent dust and debris from being deposited on motor, fan wheels and coils. Failure to do so may have serious adverse effects on unit operation and in the case of motor and blower assembly, may result in immediate or premature failure. Failure of any unit caused by deposits of foreign material on the motor or blower wheels will not be covered by the manufacturer's warranty. Some units and/or job conditions may require some form of temporary covering during construction.

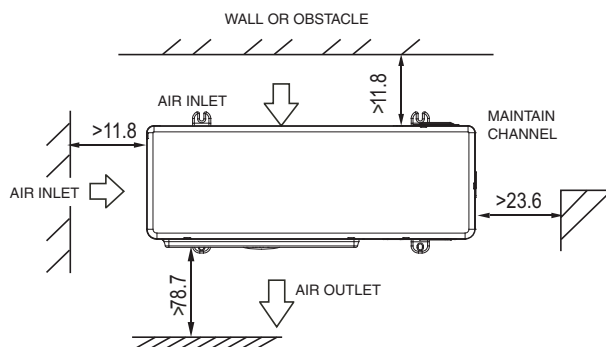
### PREPARING JOBSITE FOR UNIT INSTALLATION

To save time and to reduce the possibility of costly errors, set up a complete sample installation in a typical location at jobsite. Check all critical dimensions such as pipe, wire, and duct connections requirements. Refer to job drawings and product dimension drawings as required. Instruct all trades in their parts of the installation. Units must be installed in compliance with all applicable local code requirements.

**IDENTIFYING AND PREPARING UNITS** — Be sure power requirements match available power source. Refer to unit nameplate and wiring diagram. In addition:

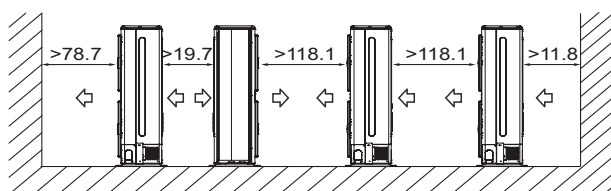
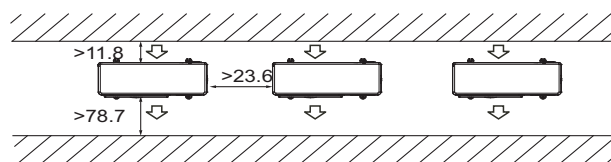
- Check all tags on unit to determine if shipping screws are to be removed. Remove screws as directed.
- Rotate the fan wheel by hand to ensure that the fan is unrestricted and can rotate freely. Check for shipping damage and fan obstructions. Adjust blower motor as required.

**Step 2 — Position the Unit** — Units are suitable for outdoor use only. For single unit installation, see Fig. 3. For multiple or parallel unit installation, see Fig. 4. Unit should be mounted on concrete and fastened to anchor bolts to prevent the unit from tipping. See Fig. 5 for mounting details. Units installed in areas that are exposed to ambient temperatures below freezing (32 F) should be installed on a snow/ice stand as defined by local codes.



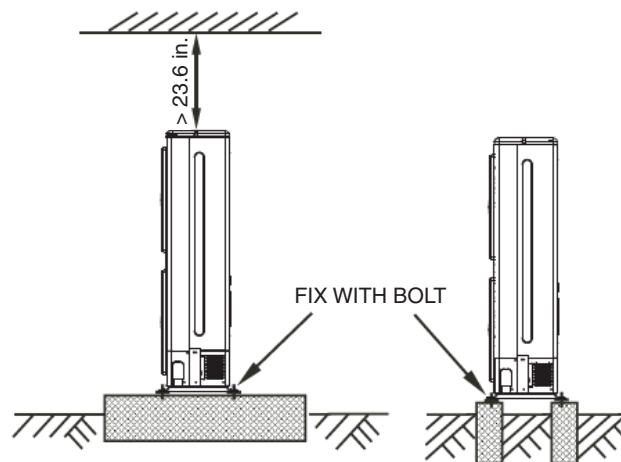
NOTE: ALL DIMENSIONS SHOWN IN INCHES.

**Fig. 3 — Single Unit Installation**



NOTE: ALL DIMENSIONS SHOWN IN INCHES.

**Fig. 4 — Multiple or Parallel Unit Installation**



**Fig. 5 — Mounting Unit on Concrete**

**Step 3 — Connect Refrigerant Piping and Wiring** — Four refrigerant piping and wiring options are available:

- Front: Use the knockout on the front for this option.
- Side: Remove the L-shaped metal plate.
- Back: Remove the rubber blanket covering the supporting pipe.
- Bottom: Use the knockouts on the bottom from inside out to create the pipe opening.

See Fig. 6 for details.

**INSULATION** — Liquid lines and suction lines must be insulated separately. Closed-cell insulation with fire-retardant properties is recommended.

For copper pipes less than 1/2 in. OD, recommended insulation thickness is 1/2 inch.

For copper pipes equal to or greater than 5/8 in. OD, recommended insulation thickness is 3/4 inch.

**PIPING CONNECTIONS BETWEEN OUTDOOR AND INDOOR UNITS**

<b>⚠ CAUTION</b>
During brazing, keep nitrogen in the pipes to avoid oxidation inside the pipes. Use soapy water or refrigerant leak detector to verify every joint in the refrigeration piping.

Indoor units are connected to the outdoor units using branch piping or branch box methods. See Fig. 7 and 8. Table 2 lists

main pipe sizes. Branch pipe sizing depends on the size of the indoor unit selected. See Table 3. Table 4 lists the maximum number of indoor units and connected capacity range per 38WAH outdoor unit. See Fig. 9 for allowable piping lengths and elevation differentials.

**Table 2 — Main Pipe Sizing**

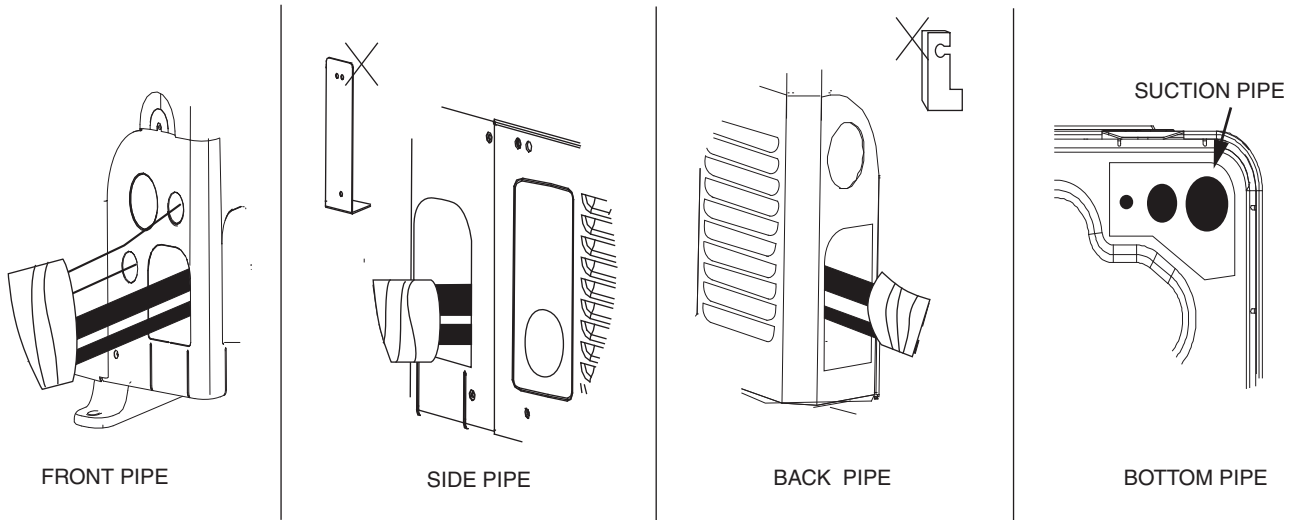
38WAH UNIT	CAPACITY (tons)	MAIN PIPE SIZE	
		SUCTION SIDE (in.)	LIQUID SIDE (in.)
036	3	5/8	3/8
048	4		

**Table 3 — Branch Pipe Sizing**

INDOOR UNIT SIZE (Btuh)	SUCTION SIDE (in.)	LIQUID SIDE (in.)
7,000 to 15,000	1/2	1/4
18,000 to 48,000	5/8	3/8

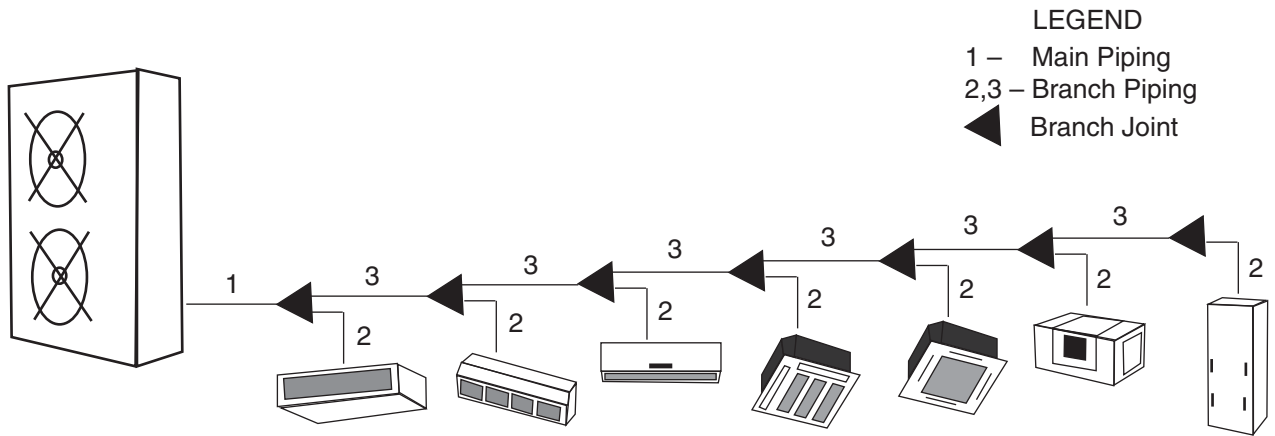
**Table 4 — Maximum Indoor Unit Connections**

38WAH UNIT	MAXIMUM NUMBER OF INDOOR UNITS	CONNECTED CAPACITY (%)
036	5	50 to 130
048	7	



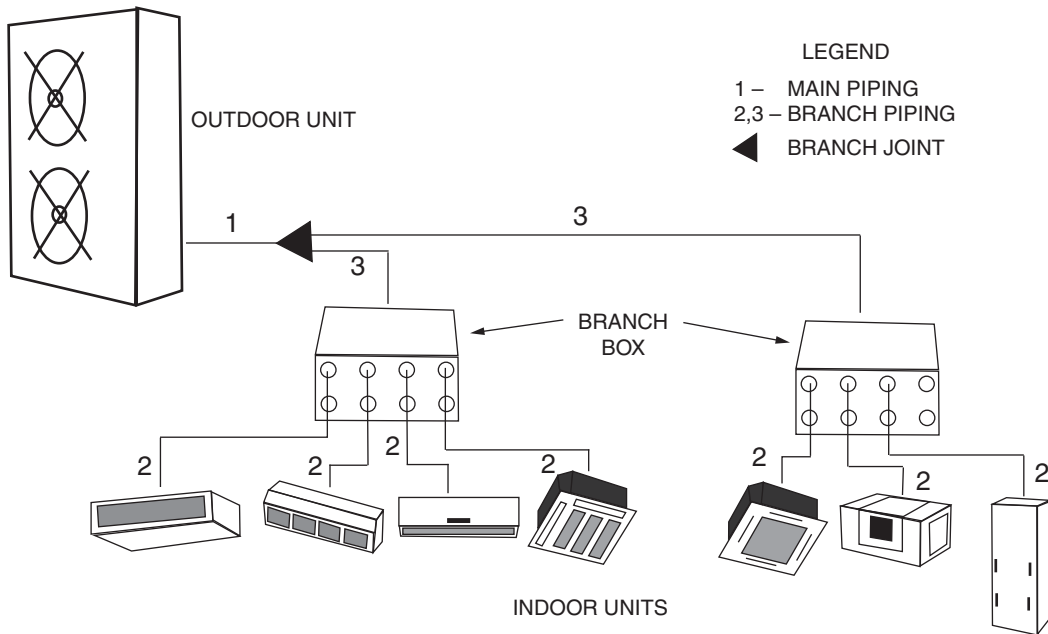
**NOTE:** All wiring must use conduit connection points provided and comply with NEC (National Electrical Code) and local codes.

**Fig. 6 — Piping and Wiring Options**



NOTE: Indoor units must not be connected directly to main piping (1).

**Fig. 7 — Branch Piping Layout**

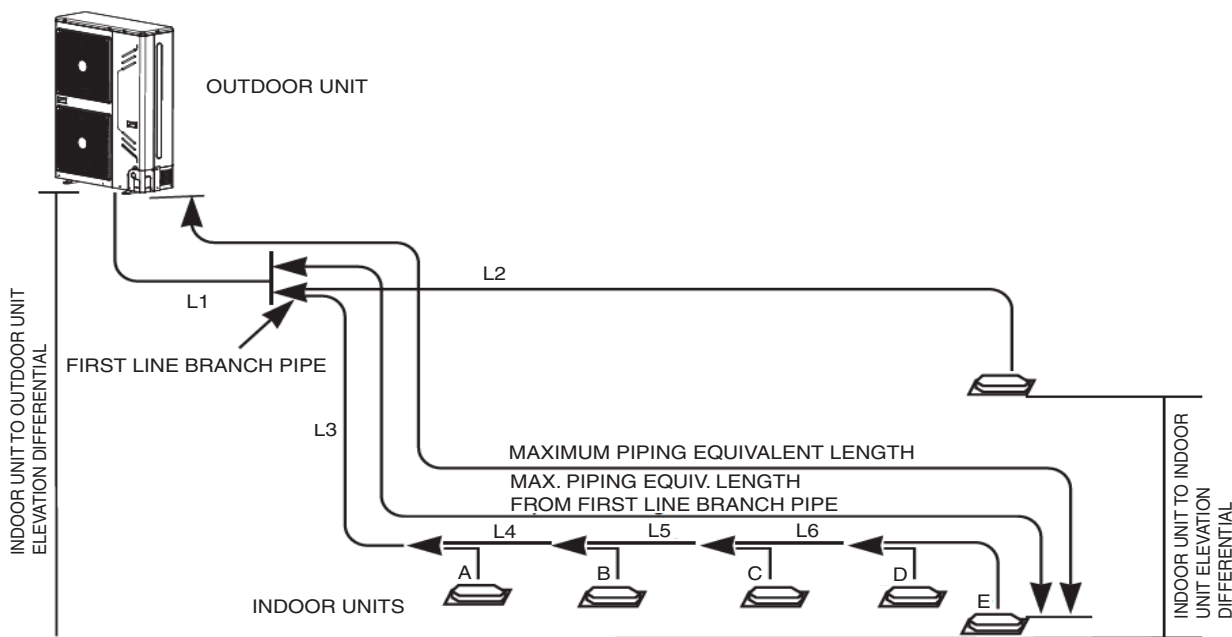


NOTE: Indoor units must not be connected directly to main piping (1).

**Fig. 8 — Branch Box Piping Layout**

PIPING LENGTH	ALLOWABLE VALUE (ft)	PIPES
TOTAL PIPING LENGTH (ACTUAL)	≤ 328	L1 + L2 + L3 + L4 + L5 + L6 + A + B + C + D + E
MAXIMUM PIPING (L)		
Actual	≤ 148	L1 + L3 + L4 + L5 + L6 + E
Equivalent	≤ 164	
FIRST TO FARTHEST INDOOR UNIT	≤ 66	L3 + L4 + L5 + L6 + E

ELEVATION DIFFERENTIAL	ALLOWABLE VALUE (ft)
INDOOR UNIT TO OUTDOOR UNIT	
Outdoor Unit Above	98
Outdoor Unit Below	66
INDOOR UNIT TO INDOOR UNIT	26



**Fig. 9 — Allowable Piping Length and Drop Height**

**Step 4 — Pressure and Vacuum Test System**

Use nitrogen to carry out the system pressure test for leaks. Gage ports on the service valves for the suction and liquid lines at the outdoor unit should be used for pressure test, and the service valves should be in closed position. Use of proper gage is required to record nitrogen pressure. The system pressure test is done in two steps:

1. Charge system with nitrogen up to 150 psig. Watch the pressure gage for 4 hours. Drop in pressure indicates leak in the system. Rectify leak before moving to next step.

2. Remove nitrogen and recharge the system with nitrogen up to 500 psig. Watch the pressure gage for 6 hours. If there is no drop in pressure, remove the nitrogen and start vacuuming the system.

Vacuuming should be performed on both suction and liquid sides through the gage ports on the service valves at the outdoor unit. The service valves should be in closed position. Vacuum the system down and hold the system for 1½ hr at or below 500 micron. At this point, the system is ready to be charged with R-410A refrigerant. See Table 5 for the refrigerant amount to be added.



**Table 5 — Refrigerant Amount to be Added**

LIQUID SIDE PIPING DIAMETER (in.)	REFRIGERANT TO BE ADDED PER METER PIPING (lb)
Ø1/4	0.051
Ø3/8	0.132
Ø1/2	0.265
Ø5/8	0.397
Ø3/4	0.595
Ø7/8	0.838

NOTE: Calculate the added refrigerant according to the diameter and the length of the liquid side pipe of the outdoor unit/indoor unit connection. When the outdoor unit connects 1 indoor unit:

**Step 5 — Complete Electrical Connections —**

See Fig. 10 for typical wiring diagram.

<b>⚠ WARNING</b>
Electrical shock can cause personal injury and death. Disconnect power supply before making wiring connections. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

<b>⚠ WARNING</b>
All units must be wired strictly in accordance with the wiring diagram furnished with the unit. Any wiring different from the wiring diagram could result in personal injury and property damage.

<b>⚠ CAUTION</b>
Any original factory wiring that requires replacement must be replaced with wiring material having a temperature rating of at least 105 C. Ensure supply voltage to the unit, as indicated on the serial plate, is not more than 10% over the rated voltage or 10% under the rated voltage. Failure to follow these recommendations may result in equipment damage.

POWER SUPPLY — Electrical characteristics of the available power supply must agree with the unit nameplate rating. Circuit breaker size and supply voltage must be as shown in Table 6.

<b>⚠ CAUTION</b>
Operating unit on improper supply voltage or with excessive phase imbalance may result in equipment damage and can affect the manufacturer’s warranty.

**Table 6 — Field Wiring Sizes**

UNIT	POWER SUPPLY (V-Ph-Hz)	CIRCUIT BREAKER (A)
OUTDOOR	208/230-1-60	40/50*
INDOOR		15

\*Based on capacity.

**POWER WIRING**

Installation of wiring must conform with local codes and with NEC ANSI/NFPA 70, current editions. Units must be electrically grounded in conformance with the code. In Canada, wiring must comply with CSA C22.1, Electrical Code.

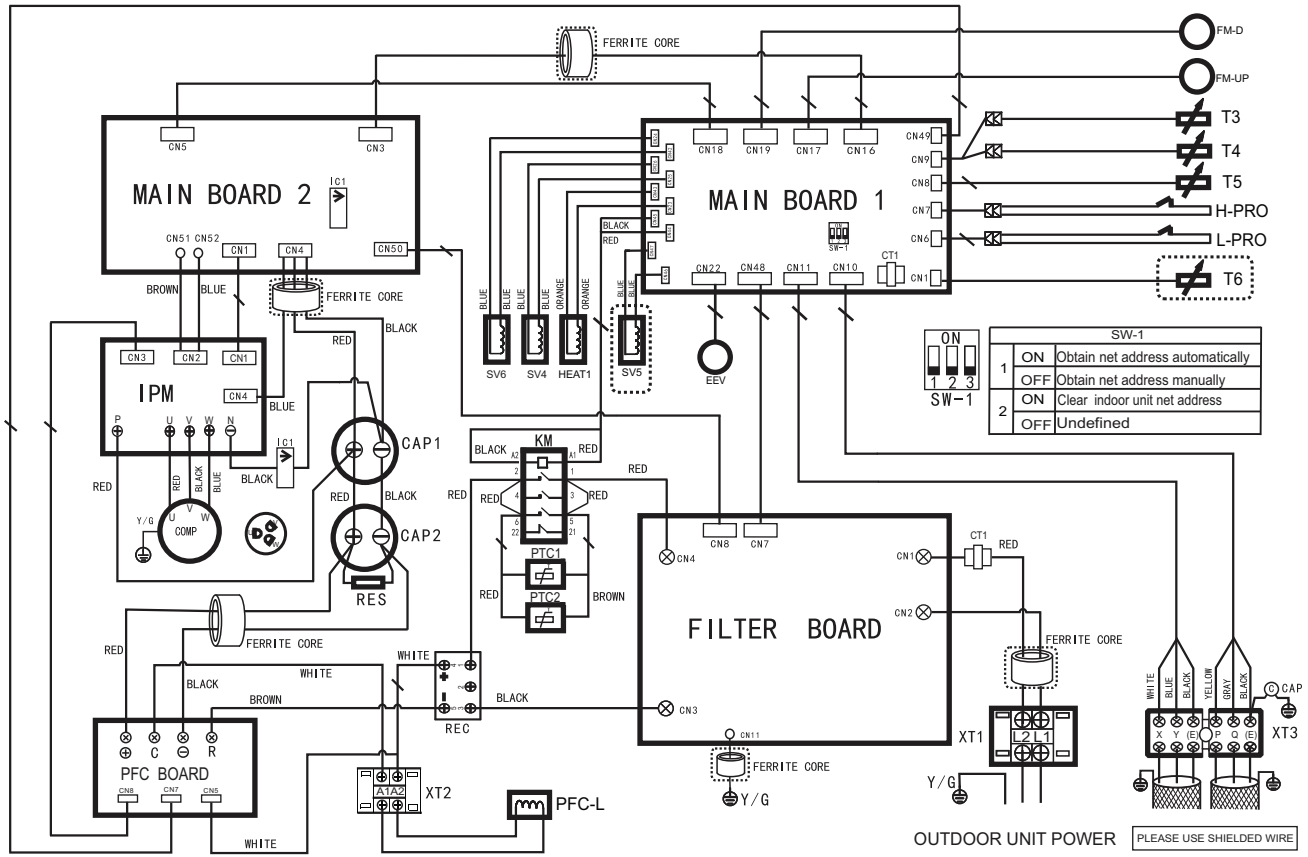
General Wiring Notes

- Separate power sources are required for indoor and outdoor units. See Fig. 11.
- The control circuit does NOT require a separate power source. See Fig. 12.
- Power entry is on the right side of the unit when facing the fan grille or front of the unit.
- Terminals for field power supply are suitable for copper conductors.

Main Power — Bring wires from the disconnect switch through the knockout hole at the bottom right corner of the unit to the control box.

CONTROL CONNECTIONS — Control power comes from the control board in the outdoor unit and does NOT require a separate source.

Use of 3-core polarized and shielded wire is required. Shield is used to protect the signal from interference. The control wire between outdoor and indoor units is bus type. See Fig. 13.

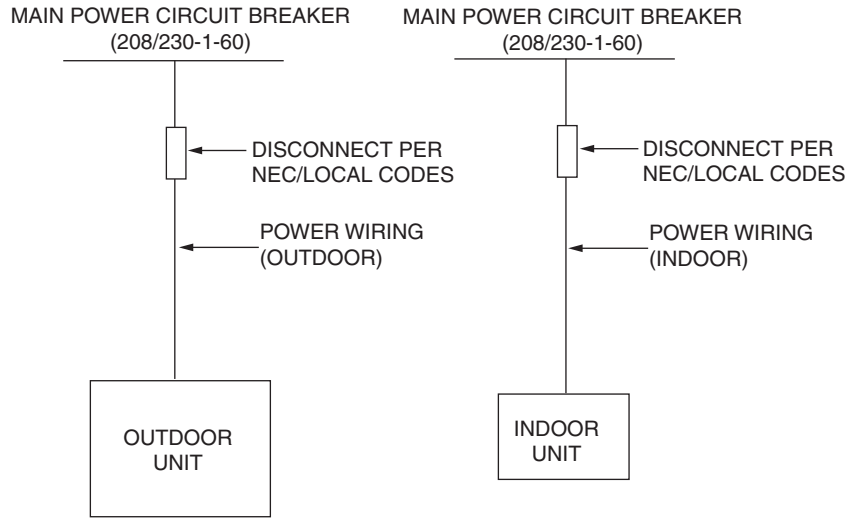


**LEGEND**

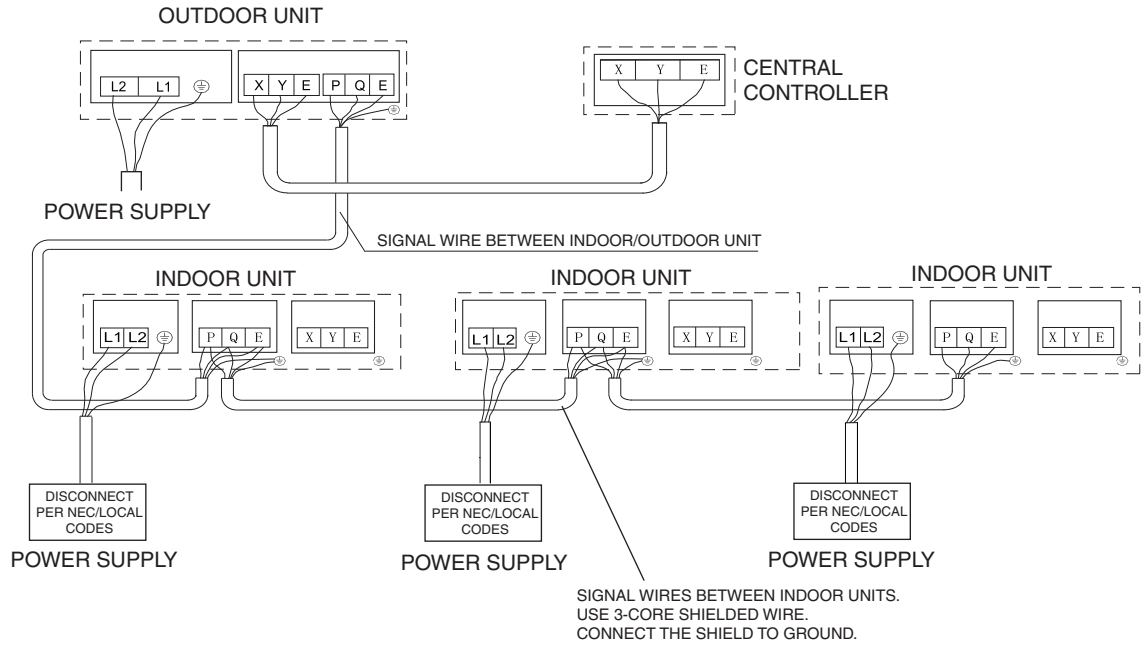
- CAP** — Capacitor
- COMP** — Compressor
- CT1** — AC Current Sensor
- EEV** — Electric Expansion Valve
- FM-D** — Outdoor Fan Motor - Down
- FM-UP** — Outdoor Fan Motor - Up
- HEAT1** — Crankcase Heater
- H-PRO** — High-Pressure Switch
- IC1** — DC Current Sensor
- IPM** — Intelligent Power Module
- KM** — AC Contactor
- L-PRO** — Low-Pressure Switch
- PFC** — Power Factor Correction
- PFC-L** — PFC Inductor
- PTC1, PTC2** — Positive Temperature Coefficient
- REC** — Rectifier
- RES** — Resistor
- SV4** — 4-Way Valve
- SV5, SV6** — Solenoid Valve
- T3** — Condenser Temperature Sensor
- T4** — Outdoor Ambient Temperature Sensor
- T5** — Compressor Discharge Temperature Sensor
- T6** — Radiator Temperature Sensor

NOTE: Field wiring to use copper conductors only.

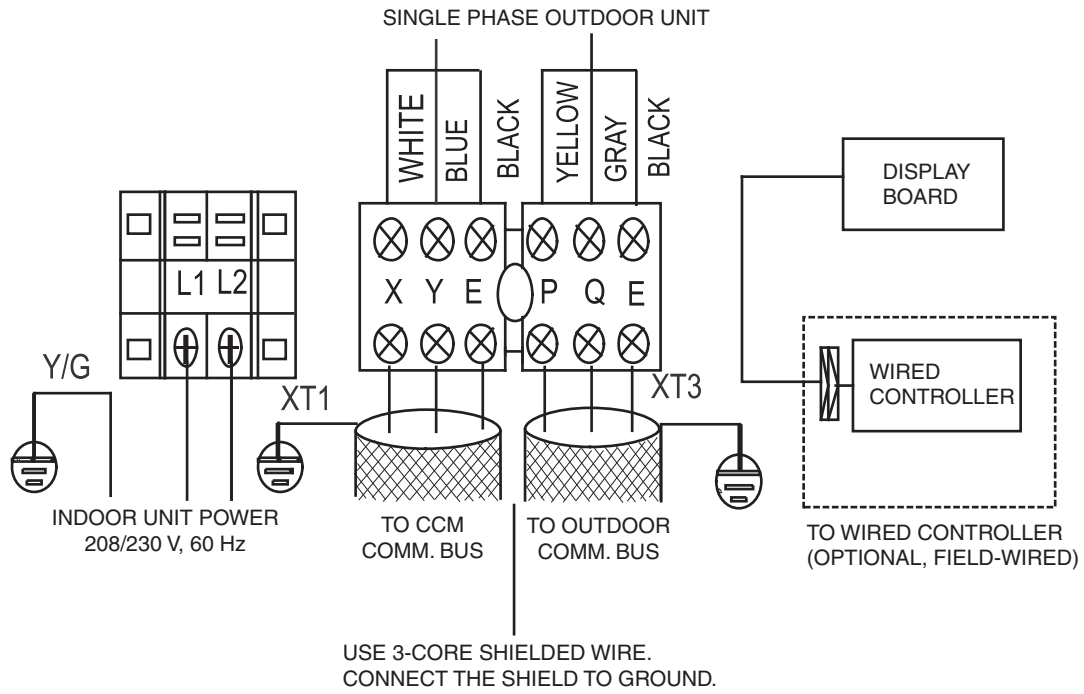
**Fig. 10 — 38WAH036,048 Typical Wiring Diagram**



**Fig. 11 — Power Wiring**



**Fig. 12 — Control Wiring**



**Fig. 13 — Control Wiring Details**

## START-UP

**Pre-Start Check** — Once installation is complete, make the following pre-start checks:

1. All indoor and outdoor units are properly installed.
2. All piping and insulation is complete.
3. All electrical connections (both power and control) are properly terminated.
4. All condensate drains are installed correctly.
5. The power supply is of the right voltage and frequency.
6. The units are properly grounded in accordance with current electrical codes.
7. Suction and liquid line service valves are in open position.

**System Operation Check** — Once the installation and pre-start checks are completed, follow these steps:

1. Using remote controller, select cooling or heating mode to check the operation of the system.
2. While the system is in operation, check the following on indoor unit:
  - a. Switches or buttons on the remote controller are easy to push.
  - b. Indicator light is showing normal operation and no error is indicated.
  - c. Swing mode of air louvers is working (if applicable to unit).
  - d. Drain pump operation is normal (if applicable).
  - e. No abnormal vibration or noise is noticed.
3. While the system is in operation, check the following on outdoor unit:
  - a. No abnormal vibration or noise is noticed.
  - b. Condenser fan is in operation.
  - c. Indicator light is showing normal operation and no error is indicated.

**NOTE:** If the unit is turned off or restarted, there is a time delay of 3 minutes for the compressor to start from the time the power is restored.

## MAINTENANCE

### ⚠ CAUTION

When servicing or repairing this unit, use only factory-approved service replacement parts. Refer to the rating plate on the unit for complete unit model number, serial number and company address. Any substitution of parts or controls not approved by the factory will be at the owner's risk and may result in equipment damage.

### ⚠ CAUTION

To avoid equipment damage, do not attempt to reuse any mechanical or electrical controllers that have been wet. Replace defective controller.

The following are recommended guidelines. Jobsite conditions may dictate that the maintenance schedule be performed more often than recommended here.

**EVERY 3 MONTHS:**

- Check coil condition. Clean the coil if necessary.

**EVERY 6 MONTHS** — Follow 3-month maintenance schedule. In addition:

- Check for and remove debris that may have settled around the base of the outdoor unit.
- Check for proper condensate drainage (clear basepan).
- Eliminate any standing water inside the outdoor unit.

**EVERY 12 MONTHS** — Follow 6-month maintenance schedule. In addition:

- Be sure all electrical connections are secure.
- Check the heating and cooling action to confirm proper operation.

## TROUBLESHOOTING

There are two buttons on Main Board 1 that can aid during troubleshooting.

**SW1** — Push this button to operate the complete system in Cooling mode. (This function is typically used if error messages are received during the commissioning process.)

**SW2** — Push this button to run a system check. This function checks that the entire system is in operation, including all indoor units.

Table 7 lists errors, possible causes, and possible solutions.

**Table 7 — Troubleshooting**

ERROR	MODE/STATUS	POSSIBLE CAUSES	POSSIBLE SOLUTIONS
E0	EEPROM Error (Data Storage)	Chip or Main Board 1 damage	Replace Main Board 1.
E1	PFC protection	PFC board damage	Replace PFC board.
E2	Communication error between outdoor and indoor unit	Power OFF on indoor or outdoor unit	Turn the power ON for indoor or outdoor unit.
		Control cable of wrong type	Use shielded cable and provide proper grounding.
		Incorrect signal wire polarity	Reconnect signal wires with correct polarity.
		Signal wire continuity broken	Replace the signal wire.
		Main Board 1 damage	Replace Main Board 1.
E3	Communication error between Main Board 1 and Main Board 2	Main Board 2 faulty or damaged (LED flashing)	Replace Main Board 2.
		Improper voltage between ports P and N on IPM	Replace IPM. Correct voltage is 277 v to 345 v.
		Loose connection between CN1 port on Main Board 2 and IPM	Reconnect or tighten the connection between CN1 ports.
E4	Condenser temperature sensor (T3 & T4) malfunctioning	Loose connection at port on PC board	Tighten the connections at port on PC board.
		Sensor is short-circuited	Using multimeter, measure resistance of the sensor. If the resistance is $\leq 100$ ohms, change the sensor.
E5	Outdoor unit voltage protection	Improper voltage	Voltage measurement between L1 and L2 should be 172 v to 265 v.
		Filter board may be damaged due to improper voltage	Replace filter board.
E6	DC fan motor (outdoor unit) malfunctioning	Incorrect fan motor wiring	Correct fan motor wiring as per wiring diagram.
		Improper supply voltage between fan motor red and black terminals	Voltage should measure between 277 v and 354 v during standby state. If not, replace the PFC.
		Improper voltage between fan motor white and black terminals	Voltage should measure 15V during standby state. If not, replace the IPM.
		Improper voltage between fan motor yellow and black terminals	Voltage should measure $\leq 2.4$ v. If not, replace fan motor.
E7	Heating mode at high ambient temperature	Call for heating when ambient temperature is above 80 F	Switch the heating mode to cooling.
P0	Radiator high temperature protection	Sensor is short-circuited	Using multimeter, measure resistance of sensor. If the resistance is $\leq 100$ ohms, change the sensor.
		Radiator is not connected securely	Connect the radiator securely.
		Main Board 1 damage	Replace Main Board 1.
		High outdoor ambient temperature	Check operating range of the outdoor unit.
P1	High pressure protection	Incorrect or loose wiring between high pressure switch and main control board	Correct or tighten wiring between high pressure switch and main control board per wiring diagram.
		Broken or faulty high pressure switch	Short the high pressure switch terminal. If the system runs normally, replace the high pressure switch.
		High outdoor ambient temperature	Check the operating range of the outdoor unit.
P2	Low pressure protection	Incorrect or loose wiring between low pressure switch and main control board	Correct or tighten wiring between as per wiring diagram.
		Broken or faulty low pressure switch	Short the low pressure switch terminal. If the system runs normally, replace the low pressure switch.
		Low outdoor ambient temperature	Check the operating range of the outdoor unit.
		Lack/loss of refrigerant	Check for leaks.
		Clogged strainer	Replace strainer.
P3	Outdoor unit current protection (>30 A)	Ambient temperature higher than system rating	Check ambient temperature. If higher than system rating, stop the system and wait for ambient temperature to drop.
		Short cycling of air around/over condenser	Remove any object blocking proper cycling of air around/over condenser.
		Accumulation of dirt and dust on condenser coil	Clean condenser coil to increase heat transfer.
		Clogged refrigerant piping	Remove refrigerant from the system, flush the system with nitrogen to remove foreign particles, evacuate and recharge.
P4	High compressor discharge temperature protection	Lack/loss of refrigerant	Check for leaks.
		Incorrect wiring between compressor discharge and PC board	Correct wiring as per wiring diagram.
		Sensor is short-circuited	Using multimeter, measure resistance of the sensor. If the resistance is $\leq 100$ ohms, change the sensor.

**LEGEND**

- IPM** — Intelligent Power Module
- PC** — Process Control
- PFC** — Power Factor Correction



**Table 7 — Troubleshooting (cont)**

<b>ERROR</b>	<b>MODE/STATUS</b>	<b>POSSIBLE CAUSES</b>	<b>POSSIBLE SOLUTIONS</b>
<b>P5</b>	High condenser temperature protection	Condenser coils are covered with dirt and dust	Clean the coils to increase heat transfer rate.
		Sensor is short-circuited	Using multi-meter, measure resistance of the sensor. If the resistance is $\leq 100$ ohms, change the sensor.
		Clogged strainer	Replace strainer.
<b>P6</b>	IPM protection	Abnormal supply voltage on IPM	Provide correct voltage on IPM.
		Loose power supply connection on IPM	Tighten power supply connection on Intelligent Power Module (IPM).
		Check current across the AC to DC convertor	Replace the convertor if found faulty.
		Bad or faulty capacitor	Replace the capacitor.
		Loose connection between Main Board 2 and IPM module	Tighten connection between Main Board 2 and IPM module.
		Loose connection at the compressor terminal	Tighten connection at the compressor terminal.
		IPM module may be damaged	Replace IPM module.
Main Board 2 may be damaged	Replace Main Board 2.		
<b>P7</b>	High evaporator temperature protection	Low charge	Check the system charge.
		Evaporator coils are covered with dirt and dust	Clean the coils to increase heat transfer rate.
		Incorrect sensor wiring	Correct sensor wiring as per wiring diagram.
		Sensor is short-circuited	Using multi-meter, measure resistance of the sensor. If the resistance is $\leq 100$ ohms, change the sensor.

LEGEND

- IPM** — Intelligent Power Module
- PC** — Process Control
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**Replacement Parts** — Quote the unit type and unit serial number when ordering replacement parts or contacting the factory about the unit. This information can be found on the serial plate attached to the unit. See Fig. 14.

MODEL	38WAH036---3		
SERIAL	1015V10002		
<b>POWER SUPPLY</b>			
VOLTS	208/230	PH 1	HZ 60
VOLTAGE RANGE	253	MAX	187 MIN
MIN CKT AMP	25A		
MAX FUSE/HACR CB AMP	40A		
<b>COMPRESSOR</b>			
VOLTS	208/230	PH 1	HZ 60
RLA	13.5A	LRA	--
<b>FAN MOTOR - OUTDOOR</b>			
VOLTS	208/230	PH 1	HZ 60
FLA	1.8A	HP 1/6(2)	W OUT 170
<b>FAN MOTOR - INDOOR</b>			
VOLTS	208/230	PH 1	HZ 60
FLA		HP	W OUT
<b>REFRIGERANT CHARGE</b>			
R410A LBS	7.3		
<b>DESIGN / TEST PRESSURE GAGE</b>			
HIGH	PSI	650	
LOW	PSI	250	
CHARGE SYSTEM PER INSTALLATION INSTRUCTIONS			
SUITABLE FOR OUTDOOR USE			
	CONFORMS TO UL STD 1995 CERTIFIED TO CAN/CSA STD C22.2 NO.236		
	www.ahridirectory.org		
Carrier Corporation 7310 West Morris Street Indianapolis, IN 46231 U.S.A.			
MADE IN CHINA 340797-203 REV. A			

**Fig. 14 — Unit Serial Plate (Example)**