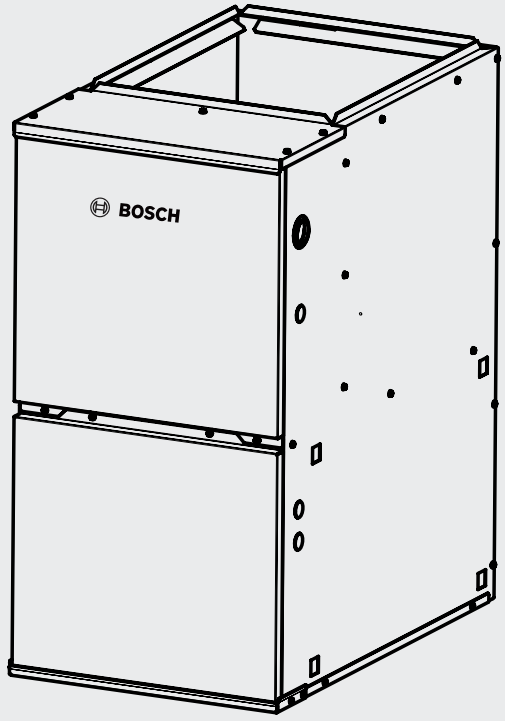
BOSCH

Installation and Operating Instructions

# Bosch IDS Heat Pump
# **115V Modular Blower**

Compatible with Bosch R454B Products

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## Table of Contents

# 1 Key to Symbols and Safety Instructions

## 1.1 Key to Symbols

**Warnings**

In warnings, signal words at the beginning of a warning are used to indicate the type and seriousness of the ensuing risk if measures for minimizing danger are not taken.

The following keywords are defined and can be used in this document:

**DANGER**

**DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.

**WARNING**

**WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION**

**CAUTION** indicates a hazardous situation which, if not avoided, could result in minor to moderate injury.

***NOTICE***

**NOTICE**

**WARNING**

**Fire, electrical shock, property damage, personal injury, or death!**

All phases of this installation must comply with NATIONAL, STATE AND LOCAL CODES. If additional information is required please contact your local distributor.

**WARNING**

**Electrical shock!**

Disconnect all power to unit before installing or servicing. More than one disconnect switch may be required to deenergize the equipment. Hazardous voltage can cause severe personal injury or death.

**WARNING**

**Electrical shock!**

If removal of the blower assembly is required, all disconnect switches supplying power to the equipment must be deenergized and locked (if not in sight of unit) so the field power wires can be safely removed from the blower assembly. Failure to do so can cause electrical shock resulting in personal injury or death.

**WARNING**

**Fire, electrical shock, property damage, personal injury, or death!**

Because of possible damage to equipment or personal injury, installation, service, and maintenance should be performed by trained, qualified service personnel.

***NOTICE***

**Product damage!**

Only use this unit in well-ventilated spaces and ensure that there are no obstructions that could impede the airflow into and out of the unit. Do not use this unit in the following locations:

- Locations with mineral oil.
- Locations with saline atmospheres, such as seaside locations.
- Locations with sulphurous atmospheres, such as near natural hot springs.
- Where high voltage electricity is present, such as in certain industrial locations.
- On vehicles or vessels, such as trucks or ferry boats.
- Where exposure to oily or very humid air may occur, such as kitchens.
- In proximity to sources of electromagnetic radiation, such as high-frequency transmitters or other high strength radiation devices.

**WARNING**

**Personal injury, product damage!**

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or persons who lack experience and

**WARNING**

**Personal Injury, flammable refrigerant!**

When pairing the 115V Modular Blower with an A2L refrigerating system, comply with the following precautions prior to conducting work on the system:

- Work shall be undertaken according to controlled procedures to minimize the risk of the presence of flammable gases or vapors while the work is being performed.
- All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.
- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable environment. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e., non-sparking, adequately sealed or intrinsically safe.
- If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available and easily accessible. Have a dry powder or $CO_2$ fire extinguisher adjacent to the charging area.
-

## 2 General

The unit can be positioned for bottom air return in the upflow position, left and right air return in the horizontal position and top air return in downflow position.

This air handler provides the flexibility for installation in any upflow, downflow or horizontal application. Adjust the motor speed tap through the DIP switch (located on the Air Handler's control board) to select correct airflow according to airflow performance table (Table 6). Please refer to wiring diagram for Dip Switch settings.

**WARNING**

**Fire hazard !**

Do not install unit in an area where flammable materials are present due to the risk of an explosion resulting in serious injury or death.

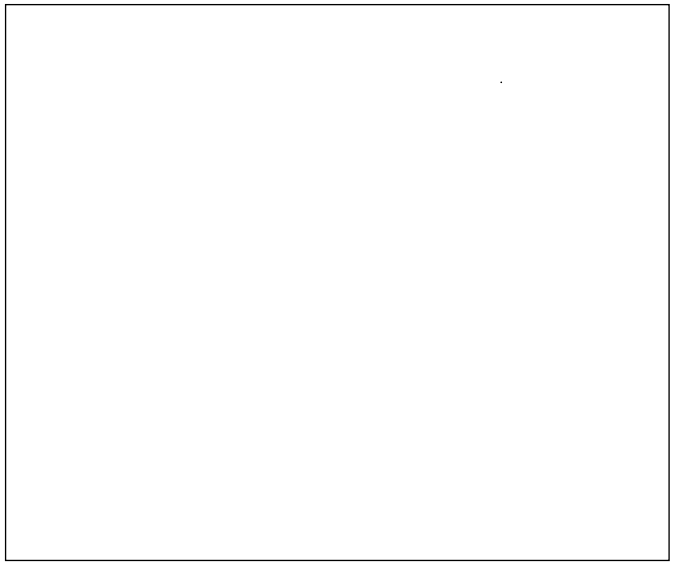
This 115V Modular Blower is not approved for installation in mobile homes, recreational vehicles, or outdoors. This blower is designed for minimum continuous return-air temperature of 60°F (16°C) (DBT) or intermittent operation down to 55°F (13°C) (DBT) such as when used with a night setback thermostat. Return-air temperature must not exceed 85°F (29°C) (DBT). Failure to follow these return-air temperature limits may affect reliability of heat exchangers, motors, and controls.

This 115V Modular Blower is for indoor installation in a building constructed on-site.

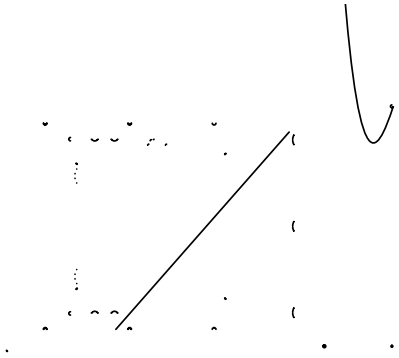
**WARNING**

**Fire hazard !**

These instructions are exclusively intended for qualified contractors and authorized installers. When pairing the 115V Modular blower with an A2L refrigerant evaporator coil, work on the refrigerant circuit with flammable refrigerant in safety group A2L may only be carried out by authorized heating contractors.These heating contractors must be trained in accordance with UL 60335-2-40, Annex HH. The certificate of competence from an industry accredited body is required. Work on electrical equipment may only be carried out by a qualified electrician. Before initial commissioning, all safety related points must be checked by the particular certified heating contractors. The system must be commissioned by the system installer or a qualified person authorized by the installer. For installation of the indoor unit, refer to the corresponding installation and operation manual. If an indoor unit is installed in an unventilated area, the area shall be so constructed that should any refrigerant leak, it will not stagnate so as to create a fire or explosion hazard. The appliance shall be stored so as to prevent mechanical damage from occurring.Do not stack combustible materials on the surface of the indoor unit.



## 2.2 Unit Dimensions



## 2.3 Components

## 2.4 A2L Refrigerant Sensor

**CAUTION**

**Fire hazard!**

According to the safety requirements of UL 60335-2-40 on combustible refrigerant A2L, when the 115V Modular Blower is used with a coil using combustible refrigerant, the unit must be equipped with the refrigerant gas detection sensor to monitor the refrigerant concentration around the unit in real time to prevent the danger of abnormal refrigerant leakage.

Refrigerant gas detection sensors are manufactured under the coil manufacturing label and must be installed by a qualified local gas supplier, distributor or service organization.

If the refrigerant gas detection sensor is not installed or is incorrectly installed, it does not meet the requirements of current regulations and cannot effectively warn of an emergency, which may cause personal injury. Therefore, follow the instructions provided in the manual.

**Installation Of Refrigerant Gas Detection Sensor:**

When installed with a Bosch BMAC Series R-454B Cased Coil, plug the refrigerant sensor cable into the CN26 port on the Main Control Board (see Figure 25).

Ensure the Dip Switch SW7-2 is set to "OFF" position. Refer to the coil manual for installation locations of refrigerant gas sensors.

# 3 Applications

The 115V Modular Blower can be installed for upflow, downflow, and horizontal positions with a cased evaporative coil.

## 3.1 Vertical Upflow (with Bottom Return)

### Bottom Return Air Inlet

The 115V Modular Blower is shipped with a bottom closure panel installed in the bottom return-air opening. Remove and discard this panel when bottom return air is used. To remove bottom closure panel, perform the following:

1. Tilt or raise the unit and remove the screw holding the bottom filler panel. (See Figure 7)
2. Remove the bottom closure panel.

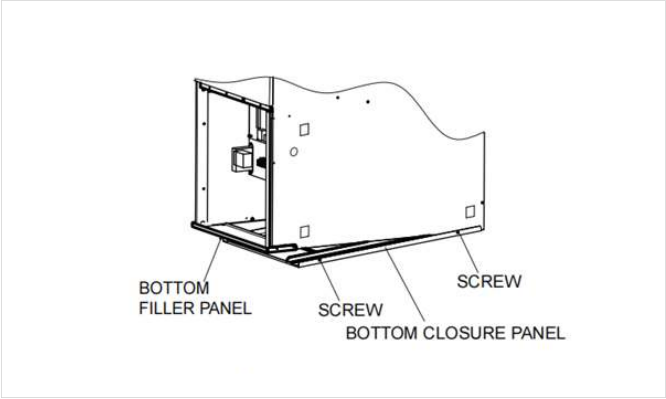
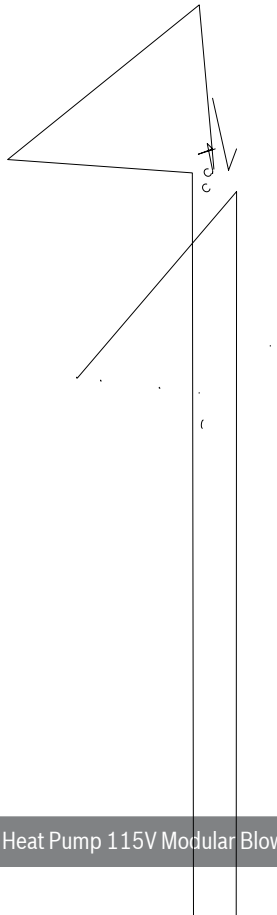



*Figure 7 Bottom Closure Panel Removal*

Upflow Installation



## 3.3 Horizontal

The 115V Modular Blower can be installed horizontally in an attic or crawl space with a bottom or either left-hand (LH) or right-hand (RH) side return. The blower can be hung from floor joists, rafters or trusses or installed on a non-combustible platform, blocks, bricks or pad. Adequate support must be provided to ensure cabinet integrity. Ensure that there is adequate room to remove service and access panels if installing in the horizontal position. Refer to instructions provided with coil for proper horizontal installations.

**WARNING**

**Product damage!**

If the drain trap and drain line will be exposed to temperatures near or below freezing, adequate measures must be taken to prevent condensate from freezing. In this scenario, it is recommended to add foam insulation around the drain line, and heat tracing may also be necessary based on the application.

A minimum clearance of 7 inches below the cabinet must be provided for the drain trap. Refer to the instructions provided with the coil being used to determine how the secondary drain should be trapped and piped.

When an evaporator coil is installed in an attic or above a finished ceiling, an auxiliary drain pan should be provided under the blower section and coil as specified by most local building codes.

### Drain Pan

A drain pan must be provided if the modular blower is installed above a conditioned area. The drain pan must cover the entire area under the 115V Modular Blower cabinet and air conditioning coil if applicable.

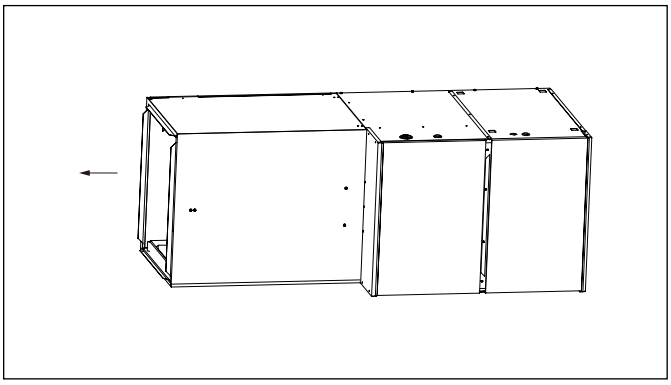


*Figure 10*

### Cabinet Suspension

If the 115V Modular Blower is installed in a crawl space, it must be suspended from the floor joist or supported by a concrete pad. Never install the 115V Modular Blower on the ground or allow it to be exposed to water. See Figure 11 and Figure 12 for further details.

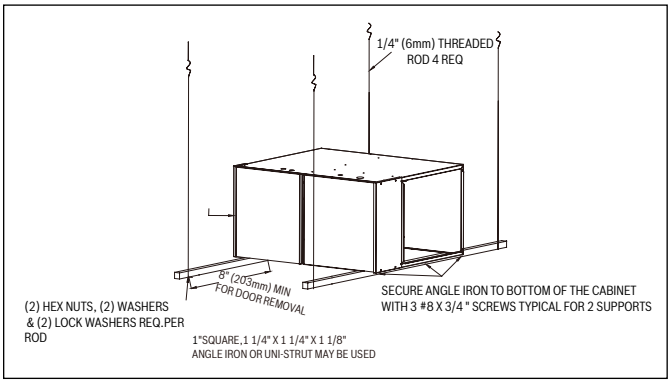



*Figure 11*

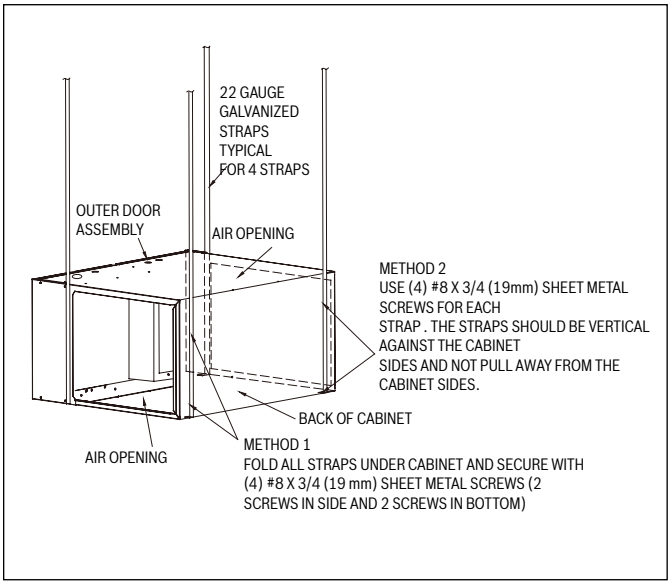



*Figure 12*

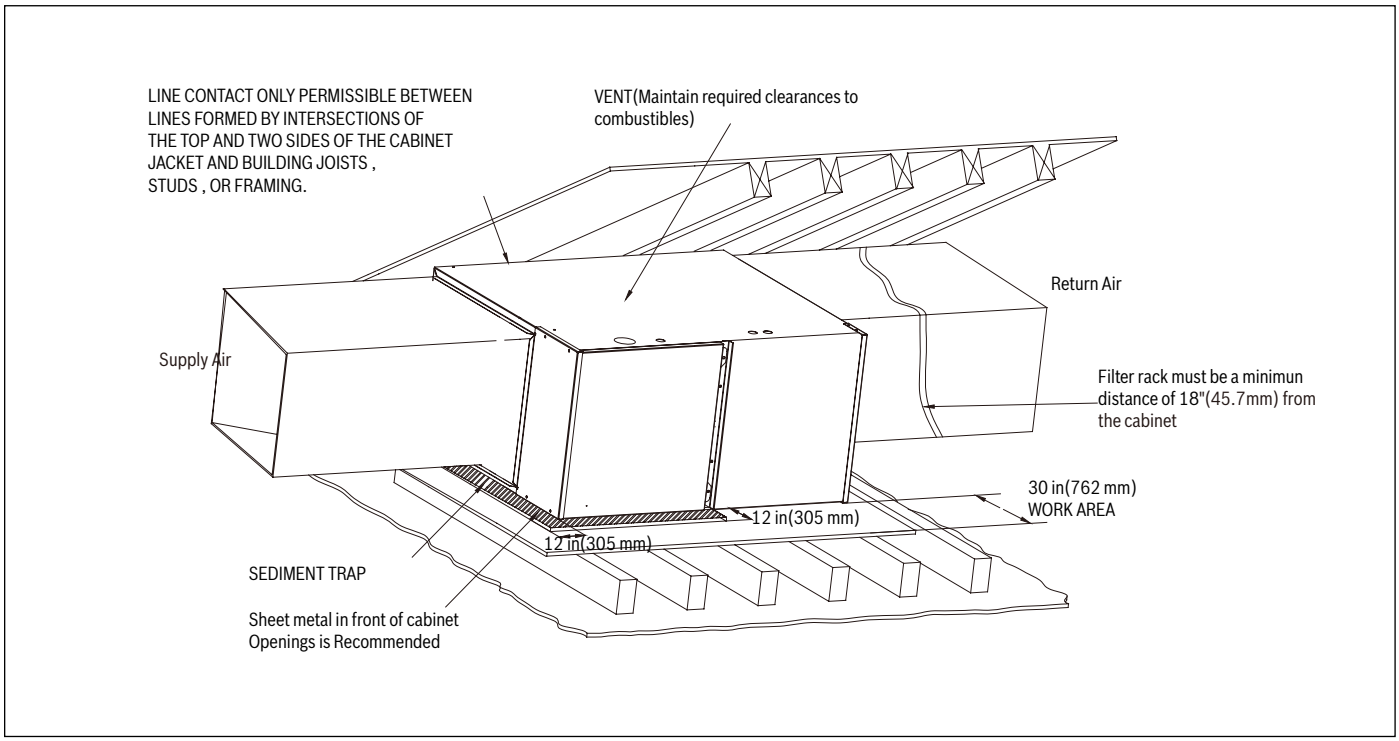



*Figure 13*

***NOTICE***

**Product damage!**

Horizontal units must be configured for right hand air supply or left hand air supply. Horizontal drain pan must be located under indoor coil. Failure to use the drain pan can result in property damage.

# 4 Electrical wiring

Field wiring must comply with the National Electric Code (C.E.C. in Canada) and any applicable local ordinances.

**WARNING**

**Electrical shock!**

Disconnect all power to unit before installing or servicing. More than one disconnect switch may be required to deenergize the equipment. Hazardous voltage can cause severe personal injury or death.

## 4.1 Power Wiring

It is important that proper electrical power is available for connection to the unit being installed. See the unit nameplate, wiring diagram, and electrical data in the installation instructions for more detailed requirements.

- If required, install a branch circuit disconnect of adequate size, located within sight, and readily accessible from the unit.

**WARNING**

**Electrical shock!**

The breaker inside the air handler unit cannot serve as circuit protection and cannot be operated by users. Maintenance personnel must disconnect the main power supply before servicing the unit.

- Supply circuit power wiring must be 167 °F (75 °C) minimum copper conductors only. See Electrical Data In this section for ampacity, wire size and circuit protector requirements. Supply circuit protection devices may be either fuses or “HACR” type circuit breakers.
- High voltage wiring may be run through knockout holes on the right, left or top of the unit.
- High voltage wiring must be connected to the red and black wiring in the control section of the air handler.
- Ensure supply voltage to the unit is not more than 10% over / under rated voltage
- Power wiring is connected to the power terminal block in unit electric cabinet

## 4.2 Control Wiring

***NOTICE***

**Product damage!**

Do not connect the communication cables with power on, otherwise it will damage the circuit board.

Do not connect the power cables (high voltage) to the PQ communication wires (low voltage),otherwise it will damage the circuit board.

Do not interconnect different communication buses (P, Q, C, B, Y, W, etc.), otherwise it will damage the circuit board.

Do not squeeze or pull the unit connection, and make sure the wiring is not in contact with the sharp edges of the sheet metal.

Make sure, after installation, separation of control wiring and power wiring has been maintained.

**WARNING**

**Electrical shock!**

Low voltage control connections are made to low voltage pigtails extending from top of air handler. **The PQ communication wires** are pre-installed on the main control board (CN30) and the terminal block. The C,B,Y,W cables are placed in the accessory bag, to be connected to the 24VAC terminals (CN14) to operate in non-communicating mode. The connectors of low voltage cables must be connected reliably and protected by insulation. The copper cables must not be exposed. Unused low voltage cables should be insulated, and the copper cables must not be exposed. Avoid sharp edges of the sheet metal for low voltage cables to prevent wear. If the wear is serious, it may lead to short circuit or electric leakage and cause danger. Do not pull the communication cables. The communication cables must be routed as closely as possible, and when there is strong electromagnetic interference in the environment, it is recommended to use shielded cables for communication cables. Otherwise, the communication may be abnormal. When the shielded cables are used, the shielding layers at both ends must be connected to sheet metal. Power cords and low voltage cables must be separated from each other with a distance of more than 2 inches to prevent interference.

Low voltage control wiring should not be run in conduit with high voltage wiring. Keep distance between the two conduits per local codes.

- Maximum Low Voltage Wiring Length can be seen in Table 4.
- See wiring diagram located on inside of blower access panel of air handler for proper wiring instruction.
- After installation, ensure separation of low voltage and high voltage wiring is maintained.

| Conventional 24V Non-Communicating Control Wires | |
|---|---|
| Wire Size | Max Length |
| 18 AWG | 150 ft. |
| 16 AWG | 225 ft. |
| PQ Communication Wire Size | |
| Wire Size | Max Length |
| 16/18 AWG | 150 ft. |

*Table 4*

PQ Communication Mode is only available for specified models.

## 4.3 Grounding

**WARNING**

**Electrical shock!**

The unit must be permanently grounded. Failure to do so can result in electrical shock causing personal injury or death.

- The ground may consist of electrical wire or metal conduit when installed in accordance with existing electrical codes.
- Grounding may also be accomplished by attaching ground wire(s) to ground lug provided in the unit wiring compartment.
- Use of multiple supply circuits require grounding of each circuit to lug provided in unit.
- Ground lug is located on the upper right side of the cabinet.

## 4.4 Electrical Data

| Model | Voltage | Frequency (Hz) | Blower Power (hp) | Speeds | Minimum Circuit Ampacity (A) | Maximum Circuit Protector |
|---|---|---|---|---|---|---|
| BMXFACTA | 115/120 | 60 | 3/4 | 5 | 11.7 | 20 (A) |
| BMXFBCTA | 115/120 | 60 | 3/4 | 5 | 11.7 | 20 (A) |
| BMXFCCTA | 115/120 | 60 | 1 | 5 | 15.4 | 25 (A) |
| BMXFDCTA | 115/120 | 60 | 1 | 5 | 15.4 | 25 (A) |

*Table 5*

## 5 Airflow Performance

Airflow performance data is based on blower CFM performance without a coil and filter in place. The blower is equipped with 5 tap speeds. Refer to the evaporator coil's airflow requirements to select the speed taps to ensure proper cooling/ heating. External static pressure should stay within the minimum and maximum limits shown in Table 6 below in order to ensure proper operation of both cooling and heating operation.

| Model | Motor Speed | | Blower CFM Without Coil, Filter, and Electric Heat | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | External Static Pressure-Inches W.C.[kPa] | | | | | | | | | |
| | | | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1 |
| **BMXFACTA** | Tap 1 | CFM | 886 | 846 | 809 | 770 | 732 | 695 | 656 | 614 | 566 | 515 |
| | Tap 2 | CFM | 1042 | 1018 | 986 | 954 | 922 | 891 | 863 | 833 | 794 | 760 |
| | Tap 3 | CFM | 1095 | 1070 | 1045 | 1010 | 980 | 948 | 916 | 885 | 858 | 826 |
| | Tap 4 | CFM | 1210 | 1181 | 1155 | 1132 | 1098 | 1071 | 1044 | 1015 | 987 | 957 |
| | Tap 5 | CFM | 1271 | 1248 | 1228 | 1200 | 1175 | 1145 | 1119 | 1090 | 1062 | 1039 |
| **BMXFBCTA** | Tap 1 | CFM | 999 | 940 | 884 | 825 | 751 | 675 | 539 | 480 | 443 | 413 |
| | Tap 2 | CFM | 1191 | 1141 | 1092 | 1043 | 993 | 934 | 873 | 808 | 733 | 610 |
| | Tap 3 | CFM | 1253 | 1205 | 1158 | 1114 | 1068 | 1017 | 958 | 893 | 832 | 762 |
| | Tap 4 | CFM | 1386 | 1341 | 1301 | 1258 | 1217 | 1172 | 1124 | 1075 | 1021 | 961 |
| | Tap 5 | CFM | 1468 | 1430 | 1388 | 1345 | 1304 | 1268 | 1224 | 1175 | 1128 | 1076 |
| **BMXFCCTA** | Tap 1 | CFM | 1464 | 1413 | 1362 | 1313 | 1264 | 1209 | 1155 | 1101 | 1052 | 1001 |
| | Tap 2 | CFM | 1564 | 1519 | 1474 | 1427 | 1386 | 1335 | 1279 | 1235 | 1187 | 1144 |
| | Tap 3 | CFM | 1632 | 1586 | 1548 | 1497 | 1459 | 1413 | 1358 | 1310 | 1265 | 1226 |
| | Tap 4 | CFM | 1809 | 1770 | 1730 | 1690 | 1653 | 1609 | 1572 | 1530 | 1484 | 1437 |
| | Tap 5 | CFM | 1948 | 1906 | 1869 | 1831 | 1791 | 1749 | 1707 | 1662 | 1623 | 1582 |
| **BMXFDCTA** | Tap 1 | CFM | 1549 | 1570 | 1417 | 1349 | 1290 | 1218 | 1142 | 1084 | 1024 | 953 |
| | Tap 2 | CFM | 1647 | 1594 | 1532 | 1470 | 1401 | 1353 | 1294 | 1219 | 1153 | 1091 |
| | Tap 3 | CFM | 1733 | 1683 | 1622 | 1565 | 1507 | 1448 | 1400 | 1342 | 1245 | 1204 |
| | Tap 4 | CFM | 1909 | 1858 | 1808 | 1756 | 1725 | 1672 | 1617 | 1568 | 1514 | 1451 |
| | Tap 5 | CFM | 2058 | 2012 | 1962 | 1910 | 1864 | 1813 | 1763 | 1715 | 1666 | 1620 |

*Table 6*

NOTES:

1. The data shown reflects the 115V Modular Blower operating by itself.
2. The air distribution system has the greatest effect on airflow. Therefore, the contractor should use only industry-recognized procedures.
3. Duct design and construction should be carefully done. System performance can be lowered dramatically through poor design or workmanship.
4. Air supplier ducts should be located along the perimeter of the conditioned space and properly sized. Improper location or insufficient air flow may cause drafts or noise in the ductwork.
5. Installers should balance the air distribution system to ensure proper quiet airflow to all rooms in the home. An air velocity meter or airflow hood can be used to balance and verify branch and system airflow (CFM).
6. Please refer to the wiring diagram for the default fan speeds for each model

## 5.1 Indoor Fan Motor Function

### System operation and function

#### Two Stage Fan Control

The 115V Modular Blower supports two stage fan control which requires a two-stage thermostat (Y1&Y2). When there is a call for Y2, the blower motor will turn to the high speed setting. When there is a call for Y1, the blower motor will turn to the low speed setting. The unit will run at the low speed setting when there is only a G call.

The ECM motor supports 5 speeds. Customers can select the suitable speed by adjusting the SW6-1 and SW6-2 dip switches. Refer to the airflow requirements for the evaporator coil in use, as well as the Airflow Performance Table (Table 6) for the recommended airflow values. Refer to Figure 25 for dip switches settings.

If a two-stage thermostat is not available, a single-stage thermostat may be used. Please refer to Wiring Diagram section for wiring instructions. If Y1 and Y2 are jumped, the unit will only run in the high stage fan speed.

**Anti-Cold Air Fan Delay (PQ Communication Only)**
The Anti-Cold Air Fan Delay function utilizies a pressure transducer (Pc) on the outdoor unit, which prevents the blower from turning ON until the coil has reached a certain temperature. This feature prevents cold air from blowing during heating operation.

1. When SW6-3 dip switch is set to the "ON" position and the unit is in heating mode, the Anti-Cold Air Fan Delay function will activate based on the following entry condition:
    a. There is a Y1 from the thermostat to the indoor unit
2. This function will deactivate if ONE OF the following exit conditions are met:
    a. The system is  NOT running  Heat mode
    b. There is no longer a Y1 from the thermostat to the indoor unit
    c. There is a communication fault between indoor unit and outdoor unit
3. During the heating mode, the blower motor will turn on in first stage fan speed if one of the following conditions of Anti-Cold Air is satisfied:
    a. Pc ≥ 435 psi
    b. Anti-Cold Air Fan Delay have been activated for 15 minutes

**Heating Fan Delay**
If SW6-3 dip switch is set to the "OFF" position and the unit is in heating mode, the blower will operate with a 90 second delay with the fan speed dictated by Y1 or Y2 signal.

**Dehumidification (Optional)**
The 115V Modular Blower has active and passive dehumidification modes depending on the wiring to the outdoor unit. When the air handler is paired with an IDS Premium or Light series condensing unit, a DH call from a thermostat will lower the evaporator temperature and slow down the fan speed to dehumidify the space. Otherwise, only the fan speed will be lowered.

If DH wire is not connected, the unit will still function normally.

## 6 Ductwork

Field ductwork must comply with the National Fire Protection Association NFPA 90A, NFPA 90B and any applicable local ordinance(s).

**WARNING**

**Fire hazard and carbon monoxide !**

Do not, under any circumstances, connect return ductwork to any other heat producing device such as fireplace insert, stove, etc. Unauthorized use of such devices may result in fire, carbon monoxide poisoning, explosion, personal injury or property damage.

Sheet metal ductwork run in unconditioned spaces must be insulated and covered with a vapor barrier. Fibrous ductwork may be used if constructed and installed in accordance with SMACNA Construction Standard on Fibrous Glass Ducts. Ductwork must comply with National Fire Protection Association as tested by U/L Standard 181 for Class I Air Ducts. Check local codes for requirements on ductwork and insulation.

- Duct system must be designed within the range of external static pressure the unit is designed to operate against. It is important that the system airflow be adequate. Make sure supply and return ductwork, grills, special filters, accessories, etc. are accounted for in total resistance. See airflow performance tables in Section 5 of this manual.
- Design the duct system in accordance with “ACCA” Manual “D” Design for Residential Winter and Summer Air Conditioning and Equipment Selection. Latest editions are available from: “ACCA” Air Conditioning Contractors of America, 1513 16th Street, N.W., Washington, D.C. 20036. If duct system incorporates flexible air duct, be sure pressure drop information (straight length plus all turns) shown in “ACCA” Manual “D” is accounted for in system.
- Supply plenum should be attached to the 3/4” duct flanges supplied with the unit. Attach flanges around the blower outlet.

If an elbow is included in the plenum close to the unit, it must not be smaller than the dimensions of the supply duct flange on the unit.

The front flange on the return duct (if connected to the blower casing) must not be screwed into the area where the power wiring is located. Drills or sharp screw points can damage insulation on wires located inside unit.

- Secure the supply and return ductwork to the unit flanges, using proper fasteners for the type of duct used and tape the duct-to-unit joint as required to prevent air leaks.

## 7 Air Filter (Not Factory-Installed)

Filters are not included with the unit and must be field supplied.

An external filter or other means of filtration must be properly sized for a maximum of 300 feet/min. air velocity or what is recommended for the type of filter installed.

Filter application and placement are critical to airflow, which may affect the heating and cooling system performance. Reduced airflow can shorten the life of the system's major components, such as motor, elements, heat relays, evaporator coil or compressor. Consequently, we recommend that the return air duct system have only one filter location. For systems without a return air filter grill, multiple filter grills can be installed at each of the return air openings.

If adding high efficiency filters or electronic air filtration systems, it is very important that the air flow is not reduced. If air flow is reduced the overall performance and efficiency of the unit will be reduced. It is strongly recommended that a professional installation technician is contacted to ensure such filtration systems are installed correctly.

Filters with MERV ratings between 8-11 are recommended. Any installed filters with a MERV rating above 11 will negatively impact air flow and system performance.

**WARNING**

**Fire hazard!**

Do not operate the system without filters. A portion of the dust suspended in the air may temporarily lodge in the duct runs and at the supply registers. Any circulated dust particles could be heated and charred by contact with the air handler elements. This residue could soil ceilings, walls, drapes, carpets and other articles in the house. Soot damage may occur with filters in place, when certain types of candles, oil lamps or standing pilots are burned.

**WARNING**

**Property damage!**

If disposable filters are used, air passage through filters should be increased to twice the size of original air opening by using a transition duct or using two filters in V shape (see Figure 14) in normal duct size.

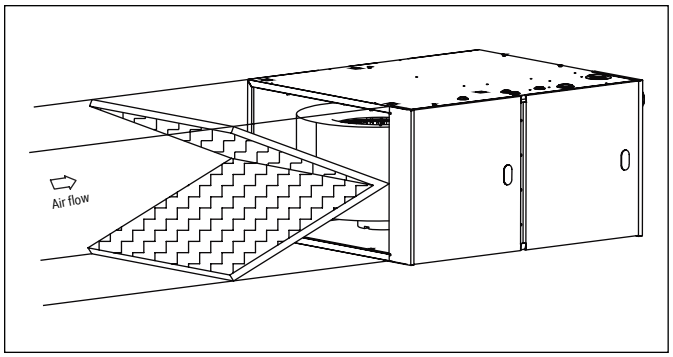



*Figure 14*

### Side Return

Locate the 4 knockout locations. These indicate the size of the cut-out to be made in the cabinet's side panel. Refer to Figure 15, Side return knockout markings.

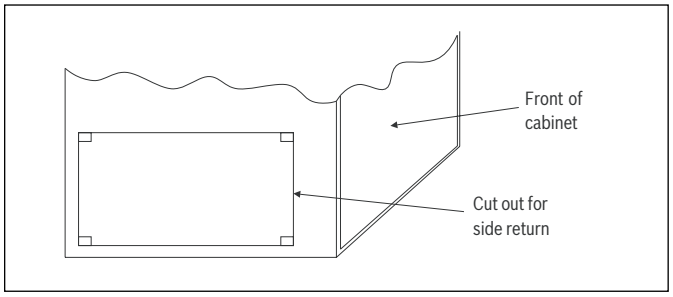



*Figure 15 Side return knockout markings*

Dimensions of return air "cut out" must match those shown in Figure 5.

DO NOT cut outside of the "knockout" markings.

Install the side filter rack (field supplied) following the instructions provided with that accessory. If a filter(s) is provided at another location in the return air system, the duct work may be directly attached to the cabinet's side panel.

### Bottom Return filters

Filter(s) may be located in the duct system outside the 115V Modular Blower using an external duct filter box attached to the cabinet plenum or at the end of the duct in a return filter grille(s). The use of straps and/or supports is required to support the weight of the external filter box.

Single side return above 1800 CFM is approved as long as the filter velocity does not exceed filter manufacturer's recommendation and a transition is used to allow for a 20x25 filter.

### 7.1 Filter Installation Dimensions

Filters are not included with the unit and must be field supplied.

| Cabinet width | Filter size | | Filter type |
|---|---|---|---|
| | Side return | Bottom return | |
| BMXFACTA | 16X25" (406X635) | 14x25" (356X635) | High Velocity (600 FPM) |
| BMXFBCTA | 16X25" (406X635) | 16X25" (406X635) | High Velocity (600 FPM) |
| BMXFCCTA | 16X25" (406X635) | 20X25" (508X635) | High Velocity (600 FPM) |
| BMXFDCTA | 16X25"(406X635) | 24X25" (610X635) | High Velocity (600 FPM) |

*Table 7*

## 8 Maintenance

For continuing high performance and to minimize possible equipment failure, periodic maintenance must be performed on this equipment.

### 8.1 Cleaning Precautions

**WARNING**

**Improper or dangerous operation, personal injury!**

Any unit repairs must be performed by qualified service personnel only.

**WARNING**

**Electrical shock!**

Always turn off your heat pump and disconnect its power supply before cleaning or maintenance.

**CAUTION**

**Personal injury!**

When removing filter, do not touch metal parts in the unit. The sharp metal edges can cut you.

***NOTICE***

**Product damage!**

Do not use chemicals or chemically treated cloths to clean the unit .

Do not use benzene, paint thinner, polishing powder or other solvents to clean the unit.

Do not operate the system without a filter in place.

### 8.2 Regular Maintenance

Your heat pump must be inspected regularly by a qualified service technician. Your annual system inspection must include:

1. Inspect the air filter every ninety days or as often as needed. If blocked or obstructed, clean or replace at once.
2. Inspection and/or cleaning of the blower wheel housing and motor.
3. Inspection and cleaning of indoor and outdoor coils as required.
4. Inspection and/or cleaning of the indoor coil drain pan and drain lines, as well as auxiliary drain pan and lines.
5. Check all electrical wiring and connections. Correct as needed, referring to the wiring diagram.

## 9 Disposal

Components and accessories from the units are not part of ordinary domestic waste.

Complete units , compressors, motors etc. are only to be disposed of via qualified disposal specialists.

This unit uses hydrogen fluorocarbons. Please contact the dealer when you want to dispose of this unit. Law requires that the collection, transportation and disposal of refrigerants must conform with the regulations governing the collection and destruction of hydrofluorocarbons.

# 10 Wiring Diagrams

**WARNING**

**Electrical shock!**

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.

**DANGER**

**Electrical shock!**

This unit must be properly grounded and protected by a circuit breaker or fuse.

**WARNING**

**Electrical shock!**

These units must be wired and installed in accordance with all National and Local Safety Codes.

- To avoid electrical shock, please ensure:
  - The heat pump is properly grounded
  - The main power plug to the heat pump has been joined with the ground wiring (DO NOT ALTER THIS).
- Do not strain the power wiring.

Low-voltage wires include indoor unit connection with outdoor unit and the indoor unit connection with the thermostats.

The wires between the indoor unit and the outdoor unit are classified into two modes: PQ communication and conventional 24VAC non-communicating thermostat control.

PQ communication mode is only available for specified models.

Dashed lines in the following thermostat wiring diagrams refer to optional wiring for Passive Dehumidification Function. For thermostat wiring please refer to the Owner's Manual of the thermostat.

Dh wiring is optional and requires a thermostat with a humidistat. Dh functions as Passive Dehumidification and will downstage the indoor fan to first stage. System will operate according to normal sequence of operations if Dh wiring is absent.

## 10.1 Communicating Set Up

**Dip switch configurations for communicating mode (default)**

Communication mode is the factory default for this system.

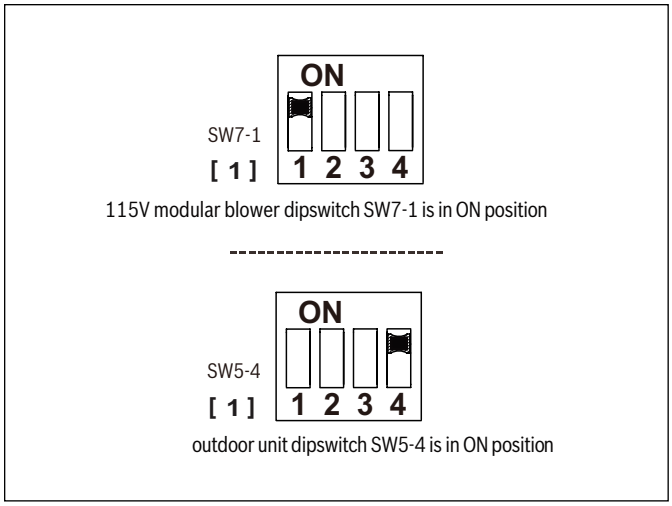



*Figure 16*

- Communicating mode will only function when the 115V Modular Blower is installed with an IDS Premium Connected ODU (BOVA20) or IDS Light ODU (BOVA15).
- PQ communication supports non-polar communication.
- If there are 2 or more systems (communication) in the same area, make sure the low voltage wires are connected to the right unit that are connected to the same refrigerant line.

**Low voltage wire connections with the outdoor unit, communicating**

1. Connect the field supplied wires to the PQ communication terminal block

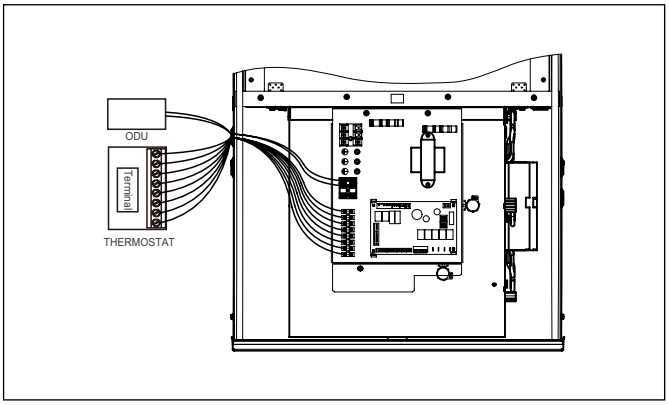



*Figure 17*

**Communicating thermostat wiring diagrams**

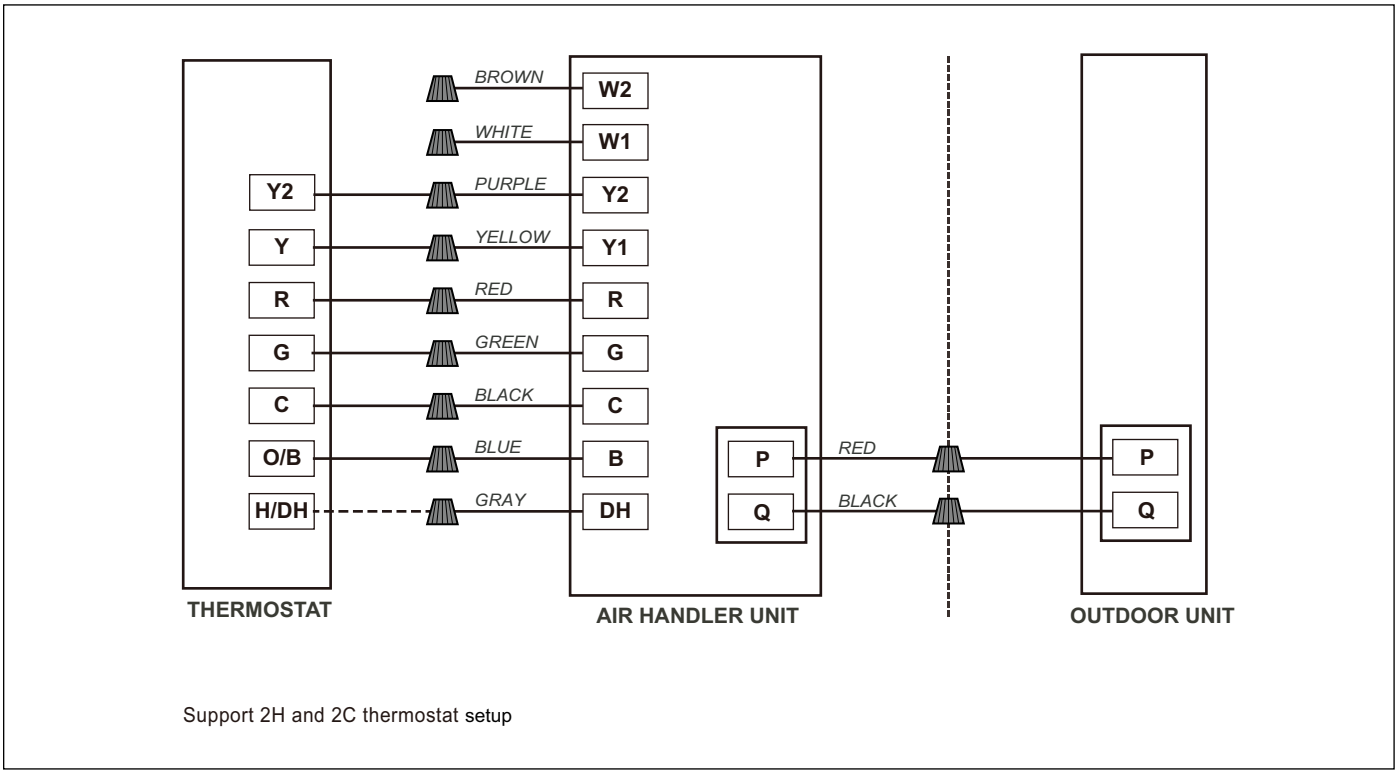



*Figure 18 Control wiring for HP systems*

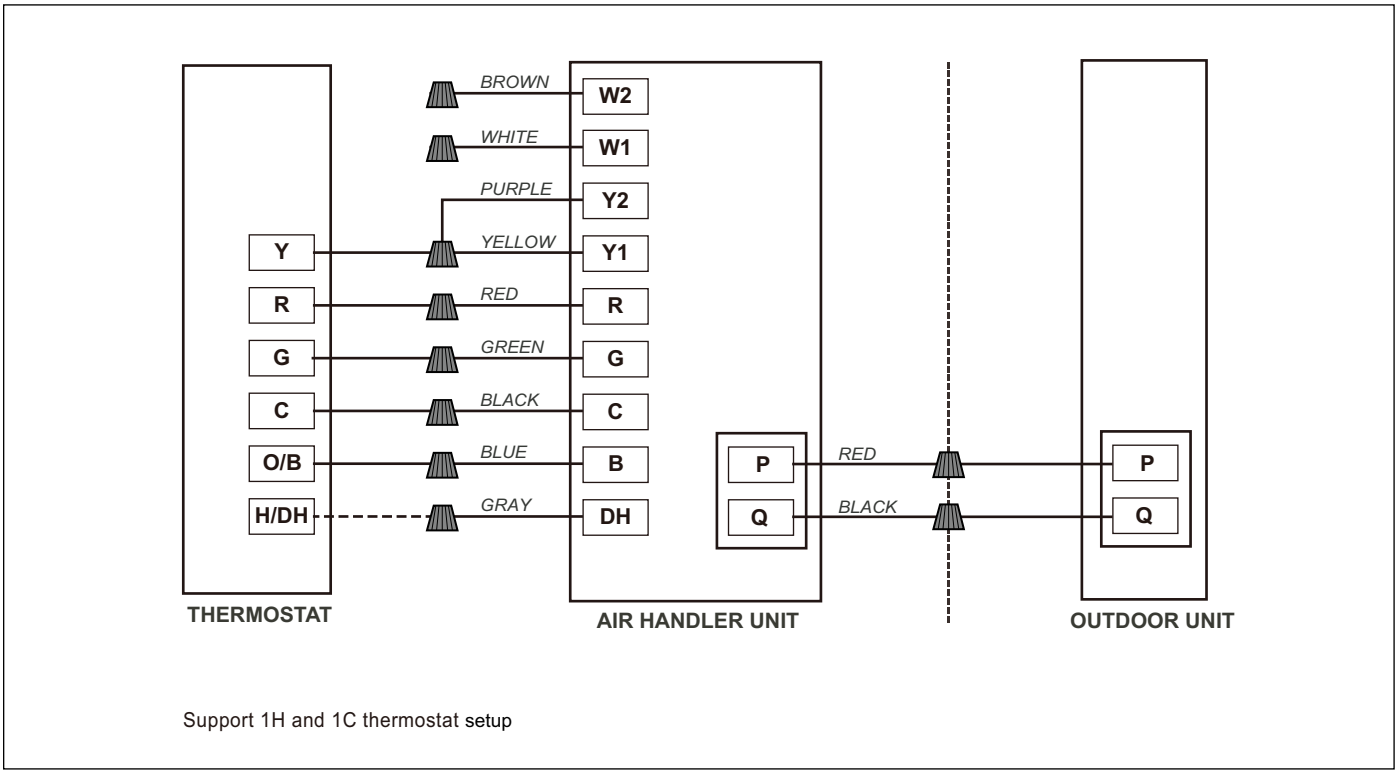



*Figure 19 Control wiring for HP systems*

## 10.2 Non-Communicating Set Up

**Dip switch configurations for non-communicating mode**

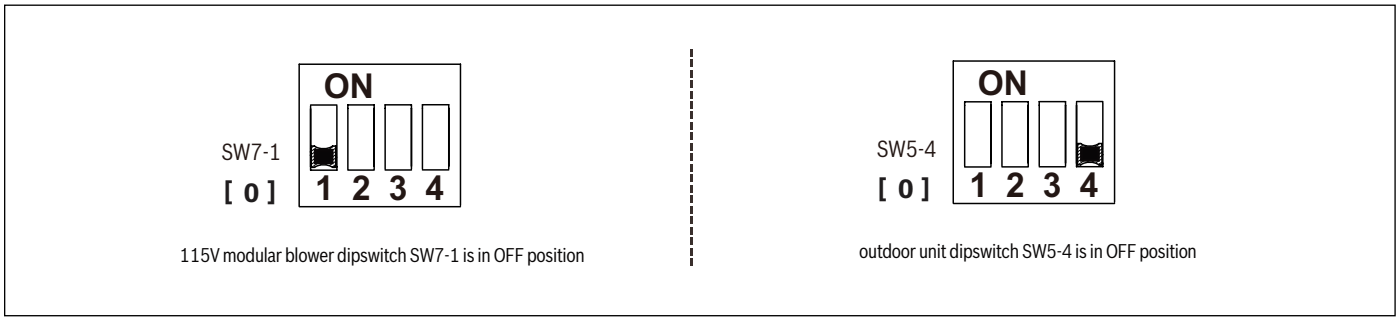



*Figure 20*

Conventional 24VAC non-communication mode is not the factory default for this system. See Figure 20 to ensure the unit is set to non-communication mode.

The 115V Modular Blower (BMXF) can be configured to non-communicating mode when there are constraints that do not allow a communicating setup.

**Low voltage wire connections with outdoor unit, non-communicating**

1. Ensure the PQ communication terminal block in the 115V Modular Blower has no connection.
2. Take out the 24VAC non-communication wires from the accessory bag and plug it into CN14 on the control board.
3. Route the 24VAC non-communication wires through a field supplied grommet, and then tighten the grommet.

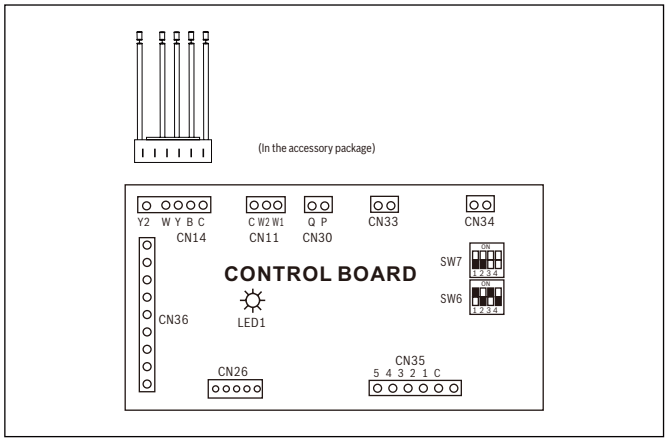



*Figure 21*

4. Connect the 24VAC non-communication wires to the four field supplied wires and connect the conventional 24VAC thermostat control wires with the thermostat.

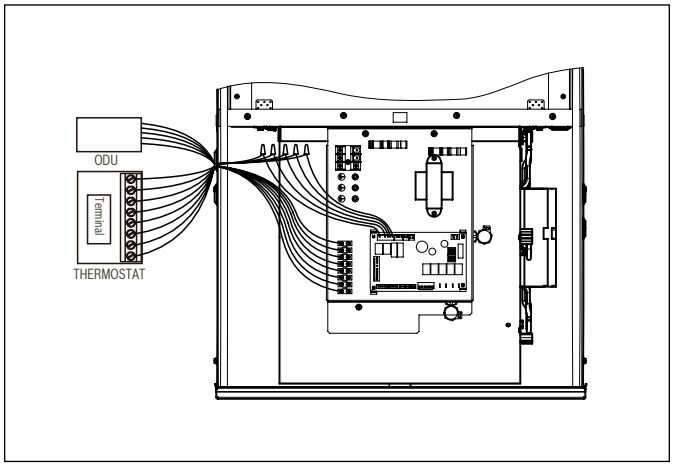



*Figure 22*

**Non- communicating thermostat wiring diagrams**

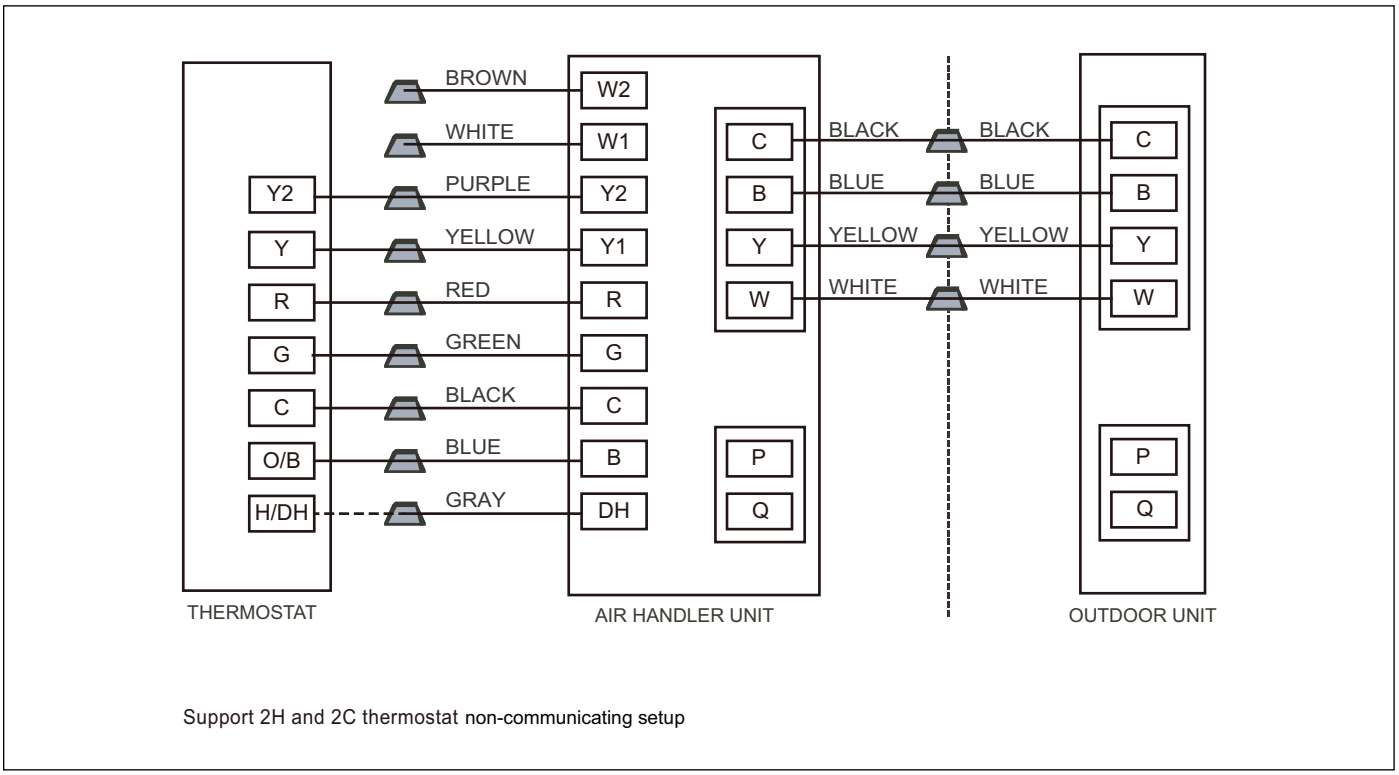



*Figure 23*

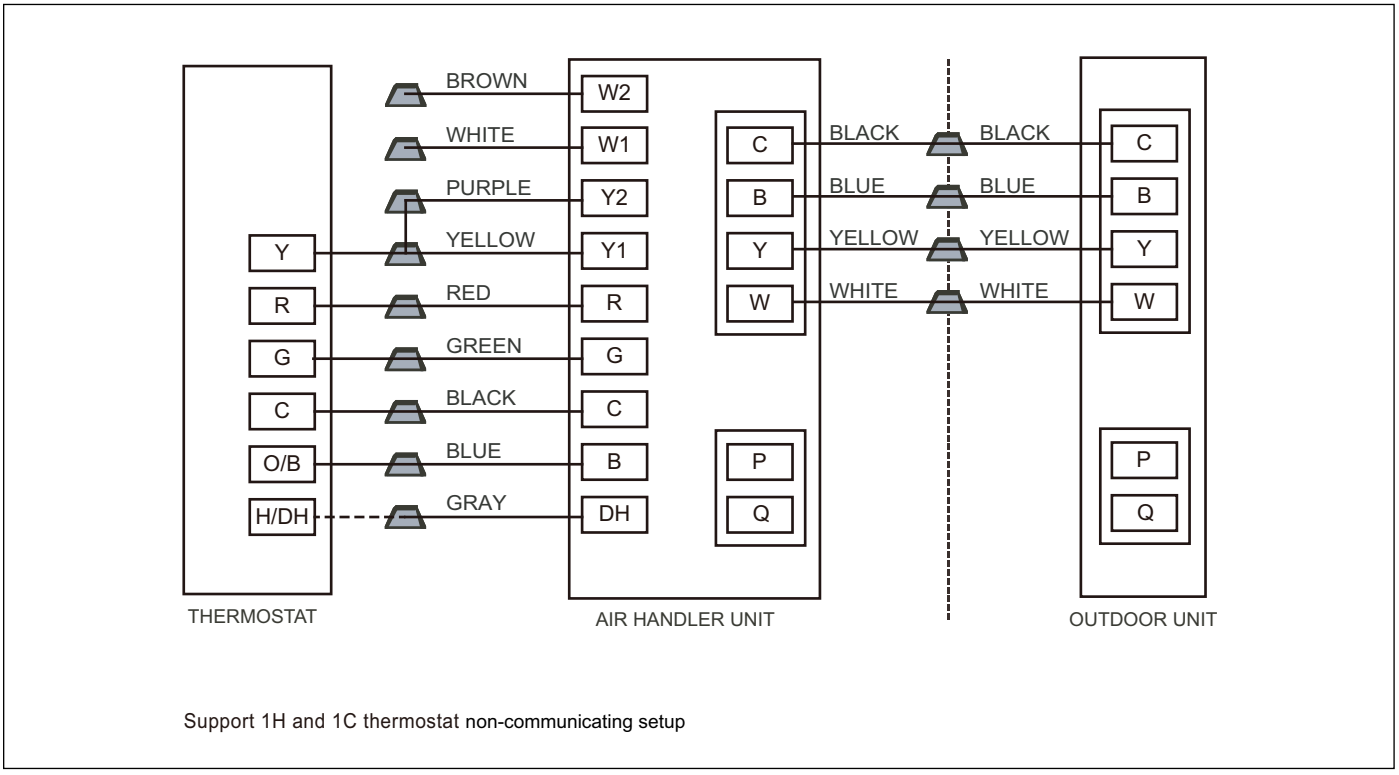
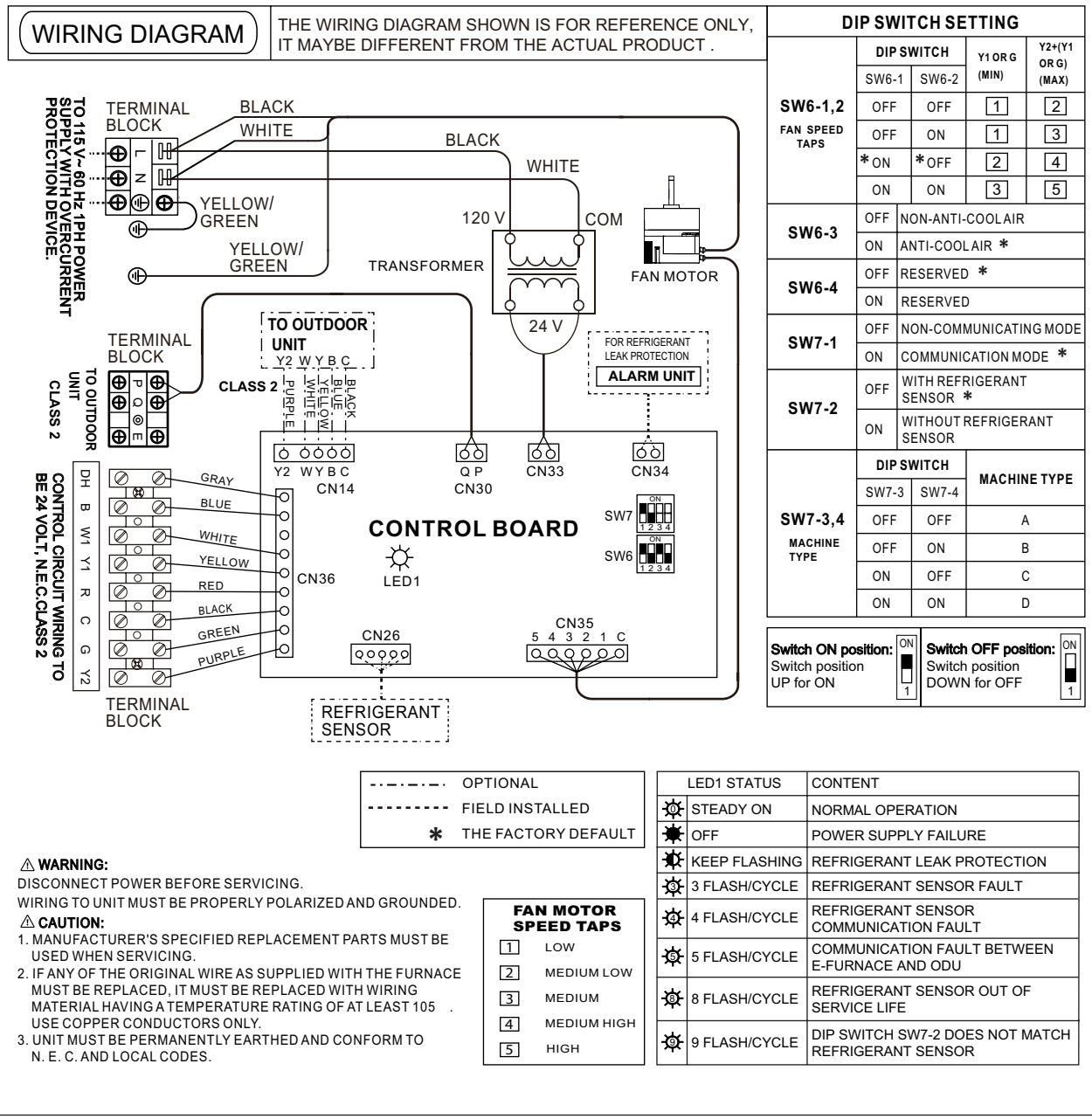



*Figure 24*




**DIP SWITCH SETTING**

| | DIP SWITCH SW6-1 | DIP SWITCH SW6-2 | Y1 OR G (MIN) | Y2+(Y1 OR G) (MAX) |
|---|---|---|---|---|
| **SW6-1,2** FAN SPEED TAPS | OFF | OFF | 1 | 2 |
| | OFF | ON | 1 | 3 |
| | * ON | * OFF | 2 | 4 |
| | ON | ON | 3 | 5 |

| | | |
|---|---|---|
| **SW6-3** | OFF | NON-ANTI-COOL AIR |
| | ON | ANTI-COOL AIR * |
| **SW6-4** | OFF | RESERVED * |
| | ON | RESERVED |
| **SW7-1** | OFF | NON-COMMUNICATING MODE |
| | ON | COMMUNICATION MODE * |
| **SW7-2** | OFF | WITH REFRIGERANT SENSOR * |
| | ON | WITHOUT REFRIGERANT SENSOR |

| | DIP SWITCH SW7-3 | DIP SWITCH SW7-4 | MACHINE TYPE |
|---|---|---|---|
| **SW7-3,4** MACHINE TYPE | OFF | OFF | A |
| | OFF | ON | B |
| | ON | OFF | C |
| | ON | ON | D |

**Switch ON position:** Switch position UP for ON

**Switch OFF position:** Switch position DOWN for OFF

| | |
|---|---|
| ----- | OPTIONAL |
| - - - - - - - - | FIELD INSTALLED |
| * | THE FACTORY DEFAULT |

**⚠ WARNING:**
DISCONNECT POWER BEFORE SERVICING.
WIRING TO UNIT MUST BE PROPERLY POLARIZED AND GROUNDED.

**⚠ CAUTION:**
1. MANUFACTURER'S SPECIFIED REPLACEMENT PARTS MUST BE USED WHEN SERVICING.
2. IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE FURNACE MUST BE REPLACED, IT MUST BE REPLACED WITH WIRING MATERIAL HAVING A TEMPERATURE RATING OF AT LEAST 105 . USE COPPER CONDUCTORS ONLY.
3. UNIT MUST BE PERMANENTLY EARTHED AND CONFORM TO N. E. C. AND LOCAL CODES.

**FAN MOTOR SPEED TAPS**

| | |
|---|---|
| 1 | LOW |
| 2 | MEDIUM LOW |
| 3 | MEDIUM |
| 4 | MEDIUM HIGH |
| 5 | HIGH |

| LED1 STATUS | CONTENT |
|---|---|
| STEADY ON | NORMAL OPERATION |
| OFF | POWER SUPPLY FAILURE |
| KEEP FLASHING | REFRIGERANT LEAK PROTECTION |
| 3 FLASH/CYCLE | REFRIGERANT SENSOR FAULT |
| 4 FLASH/CYCLE | REFRIGERANT SENSOR COMMUNICATION FAULT |
| 5 FLASH/CYCLE | COMMUNICATION FAULT BETWEEN E-FURNACE AND ODU |
| 8 FLASH/CYCLE | REFRIGERANT SENSOR OUT OF SERVICE LIFE |
| 9 FLASH/CYCLE | DIP SWITCH SW7-2 DOES NOT MATCH REFRIGERANT SENSOR |

*Figure 25*

## 11 LED Flashing Troubleshooting

Indoor unit fault codes can be diagnosed via observing the behavior of LED1. The number of flashes per cycle correspond to certain faults as described below.

| Number of flashes | Description |
|---|---|
| Continuous Flashing | R454B refrigerant Leakage fault in indoor unit |

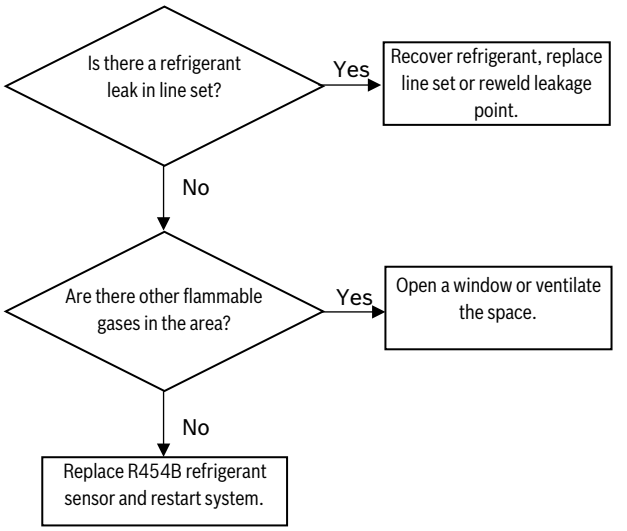



*Figure 26*

| Number of flashes | Description |
|---|---|
| 3 | Indoor unit A2L refrigerant sensor fault |

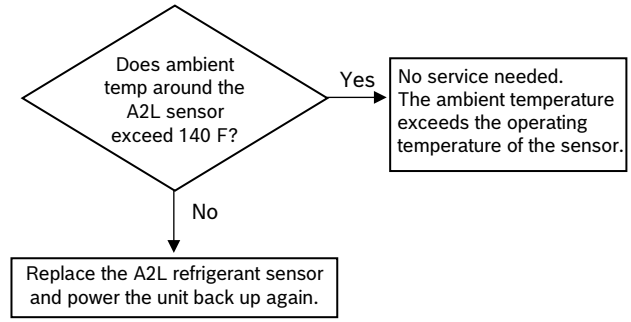



*Figure 27*

| Number of flashes | Description (Sensor) |
|---|---|
| 4 | Indoor unit A2L refrigerant sensor communication fault |

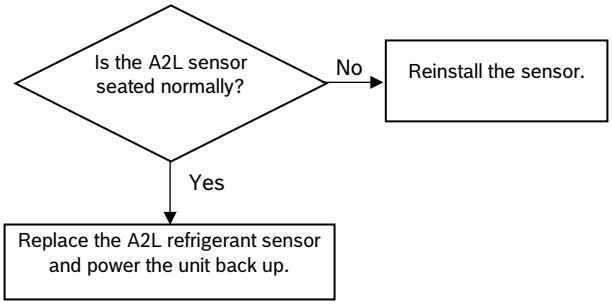



*Figure 28*

| Number of flashes | Description |
|---|---|
| 5 | Communication Fault between IDU and ODU |

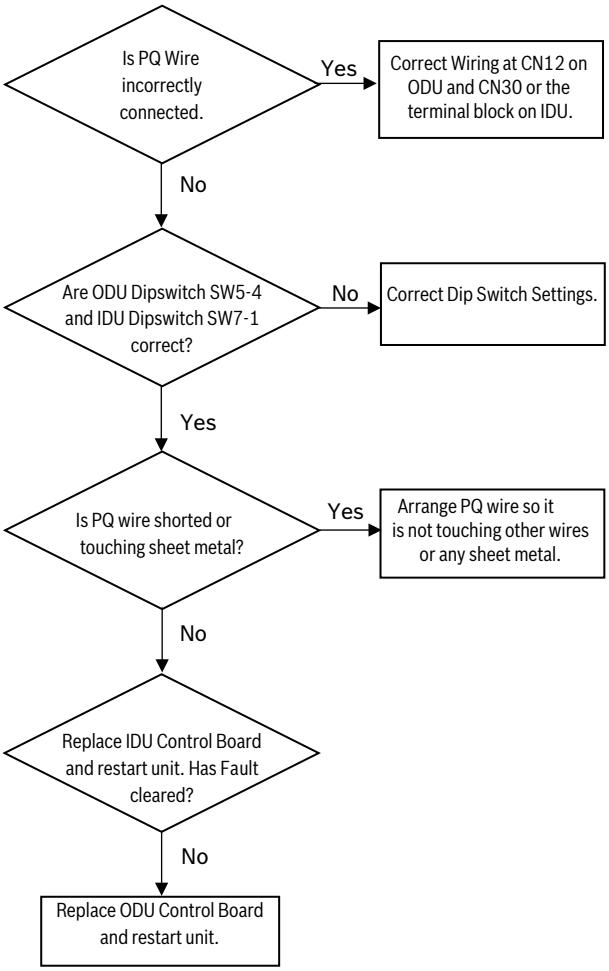



*Figure 29*

| Number of flashes | Description |
|---|---|
| 8 | Indoor unit A2L refrigerant sensor past service life |

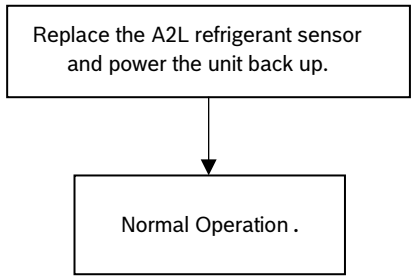



*Figure 30*

| Number of flashes | Description |
|---|---|
| 9 | Dip Switch SW7-2 does not match refrigerant sensor |

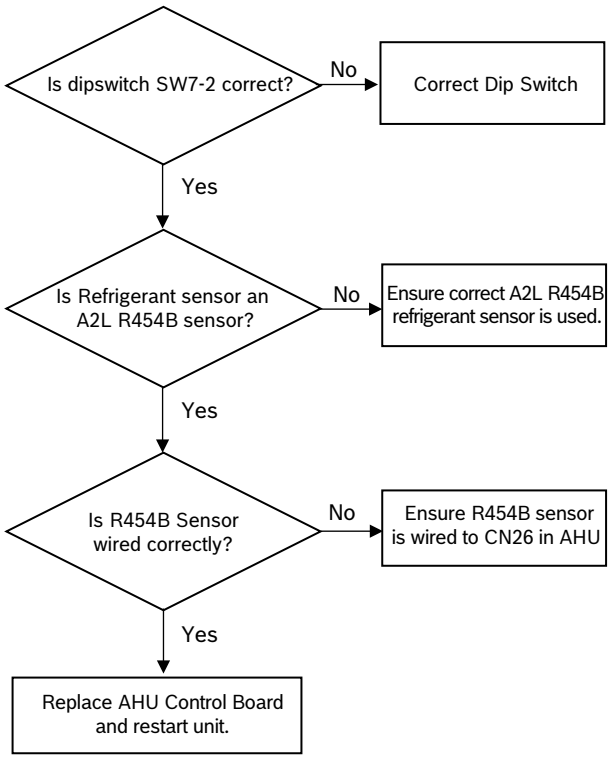



*Figure 31*

**Online Help Resources**

Alternatively, please visit our Service & Support webpage to find FAQs, videos, service bulletins, and more; www.boschheatingcooling.com/service or use your cellphone to scan the code below.

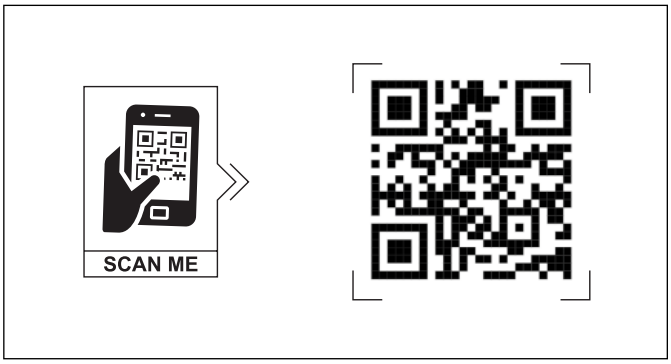



*Figure 32*

**NOTES:**

**NOTES:**

**United States and Canada**
**Bosch Thermotechnology Corp.**
**65 Grove St.**
**Watertown, MA 02472**

**Tel: 800-283-3787**
**www.bosch-homecomfort.us**

**BTC 762003317 A / 09.2025**


**Version Française**