Installation, Operation, & Maintenance

IOM 5907
Rev. C 10/25

MB, *MB-HW
SERIES FAN COIL UNITS

ATTENTION:

Read all instructions thoroughly and retain all manuals for future reference.

COPYRIGHT

WARNING

Altering the product or replacing parts with non-authorized factory parts voids all warranty or implied warranty and may result in adverse operational performance and/or a possible hazardous safety condition to service personnel and occupants. Company employees and/or contractors are NOT authorized to waive this warning.

WARNING

Only personnel trained and qualified in the installation, adjustment, servicing, maintenance, or repair of the equipment described in this manual should perform service. The manufacturer is NOT responsible for any injury or property damage arising from improper service or procedures. In jurisdictions where licensing is required to service this equipment, only licensed personnel should perform the service.

Improper installation, adjustment, servicing, maintenance, or repair—or attempting to perform these tasks without proper training—may result in product damage, property damage, personal injury, or death. Service personnel assume responsibility for any injury or property damage resulting from improper procedures.

TABLE OF CONTENTS

SAFETY CONSIDERATIONS

1. READ THE ENTIRE MANUAL BEFORE STARTING THE INSTALLATION.
2. Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause personal injury damage.
3. Consult a qualified licensed installer, service agency, or your distributor for information assistance. The qualified licensed installer or service agency must use factory-authorized kits or accessories when servicing this product.
4. Refer to the individual instructions packaged with kits or accessories when installing.
5. Follow all safety codes.
6. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and National Electrical Code (NEC) for special requirements.

This appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.
Children should be supervised to ensure that they do not play with the appliance.
Use adequate personal protection equipment when installing and performing maintenance. After switching off and locking-out an electrical disconnect, verify a safe condition with an electrical tester. Discharge a capacitor before handling any PSC motor and wiring. Use eye protection, cut resistant gloves and sleeves to protect against metal edges and screws.

RECOGNIZE THE FOLLOWING SAFETY NOTATIONS THROUGHOUT THIS MANUAL AND POSTED ON THE EQUIPMENT:

WARNING

Indicates a potentially hazardous situation or unsafe practices that could result in severe personal injury or death and/or damage to property.

WARNING

ELECTRIC SHOCK HAZARD

Signifies potential electrical shock hazards that could result in personal injury or death.

CAUTION

Indicates a potentially hazardous situation that may result in minor or moderate personal injury.

IMPORTANT

Suggests important procedure steps to insure proper installation, reliability, or operation.

NOTE

Used to highlight suggestions, which may result in enhanced installation, reliability, or operation.

	Service indicator; read technical manual
	Operator's manual; operating instructions
	Read the instructions

SAFETY INFORMATION

WARNING

These instructions are intended to aid qualified, licensed, service personnel in proper installation, adjustment, and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instructions may result in improper installation, adjustment, service, or maintenance possibly resulting in fire, electrical shock, property damage, personal injury, or death.

IMPORTANT

DO NOT TIGHTEN DRAIN PAN.
PAN BREAKAGE AND WATER LEAKS WILL RESULT.

WARNING

Electrical work associated with the installation of this appliance must comply with the National Electrical Code (NEC). Other local or regional electrical and building code requirements may apply.

In Canada electrical work associated with the installation of this appliance must comply with CE CSA C22.1.

IMPORTANT

This fan-coil must be installed in a location which is not accessible to the general public.

This appliance is for INDOOR USE ONLY.

INSTALLATION PRECAUTIONS

Installation of this fan coil should be performed only by a licensed contractor to ensure proper installation and the safety of the installer.

Observe the following precautions for typical installations:

- Always use proper tools and equipment.
- No wiring or other work should be attempted without first assuring the fan coil is completely disconnected from the power source and locked out. Verify that an uninterrupted ground connection exists prior to energizing any power sources.
- Review the rating plate and wiring diagram of each unit for proper voltage and control configurations. This information is determined from the components and wiring of the unit and may vary from unit to unit.
- When soldering and brazing, have a fire extinguisher readily available. When soldering close to water valves or other components, heat shields or wet rags are required to prevent damage.
- When the fan coil unit is in operation components are rotating at high speeds.
- Units must be level or slightly angled toward the drain nipple to ensure proper drainage and operation.
- Check the unit prior to operation to ensure that condensate water drains from the unit. An overflow drain or an auxiliary drain pan may be required as a back-up to a clogged primary drain.
- Clear the drain pan of foreign material prior to start-up.
- Check filter media installation to ensure that it is installed correctly. Use directional arrows or other information on the filter to determine the proper flow direction.
- Ensure the air distribution system does not exceed the external static rating of the unit.

INSTALLATION PRECAUTIONS (continued)

Insulation is installed in indoor equipment to provide a barrier between outside air conditions surrounding the unit and the varying conditions inside the unit. If the insulating barrier is damaged, the surrounding ambient air will affect the inside surface temperature of the cabinet. The temperature/humidity difference between the inside and outside can cause condensation to form on the inside and outside of the cabinet which leads to sheet metal corrosion and subsequently component failure.

Damaged insulation must be repaired or replaced before the unit is placed back into operation. Insulation loses its insulation value when wet, damaged, separated, or torn.

The installer must adhere strictly to all local and national code requirements pertaining to the installation of this equipment. All units are designed for indoor use only, and are agency listed for installation with zero clearance to combustible materials. This includes the fan coil cabinet, discharge plenum, and connecting ducts. These units are designed to be installed in either an up-flow or horizontal position.

GENERAL

The manufacturer does not warrant equipment subjected to abuse. Metal chips, dust, drywall tape, paint overspray, etc. can void warranties and liability for equipment failure, personal injury, and property damage. The manufacturer does not warrant equipment installed in violation of any code requirement.

These instructions give information for installation of the fan coil units only. For other related equipment, refer to the manufacturer's instructions.

Material in this shipment has been inspected at the factory and released to the transportation agency in good condition. When received, a visual inspection of all cartons should be made immediately. Any evidence of rough handling or apparent damage should be noted on the delivery receipt and the material inspected in the presence of the carrier's representative. If damage is found, a claim should be filed against the carrier immediately.

All models are designed for indoor installation only. The installation of this unit, field wiring, duct system, and other related equipment must conform to the requirements the National Electric Code, ANSI/NFPA No. 70 (latest edition) in the United States, as well as any state laws and local codes. Local authorities having jurisdiction should be consulted before installation is made.

Applicable regulations take precedence over the general precautions contained in this manual.

CAUTION

Unit must not be operated in any mode during building construction due to excessive airborne dust and debris. Also, the unit must never run under any circumstances without an air filter in place.

IMPORTANT

It is highly recommended to install an auxiliary drain pan beneath the fan coil to prevent damage which may result from an overflow of condensate.

GENERAL (continued)

WARNING

- Always wear eye protection when working on equipment.
- Before servicing unit, always turn off all power to unit. There may be more than one disconnect switch. Electrical shock can cause personal injury or death.
- When fan coil is operating, some components are operating at high speeds. Personal injury can result from touching these items with any object.
- All electrical and service access panels must be secured in their proper place before operating equipment.
- Clear surrounding area of all tools, equipment, and debris before operating unit.

FAN COIL UNIT

MBE fan coils are factory assembled for horizontal left side down installation without modification. To convert to horizontal right side down, remove the horizontal drain pan and coil and “A” coil assembly, flip horizontal drain pan over to right side and reinstall horizontal drain pan and “A” coil into cabinet. Secure forward edge of horizontal drain pan with angle bracket. The unit should be positioned to provide slope toward the condensate drain nipple.

VERTICAL INSTALLATION

Fan coil may be set on a platform and secured by screws or nails. Sufficient space for drain piping is required under the platform.

Sufficient clearance must be provided at the front of the fan coil to allow access to electrical controls and removal of the motor/blower assembly for servicing. This clearance distance should be approximately the same as the depth dimension of the fan coil unit.

MOUNTING

It is important to ensure that the fan coil unit is securely mounted and the structure is sufficient to support the weight of the equipment. All anchors for mounting the equipment must be sized and placed properly to ensure a safe and durable installation.

MBE fan coils units are supplied with a single water coil that incorporates a 1/4 in. bleed for air venting.

MOUNTING LOCATION & CLEARANCE

Select a location that will provide adequate space to mount the unit and accommodate ducting. The recommended clearance for service is 24 in. Units with or without electric heat may be installed with 0 in. clearance to combustibles. Always check the unit rating plate for clearance and other information before mounting unit. Refer to dimensional data in **Figure 4 - Unit Physical Dimensions** and **Table 1 – Physical Dimensions** for units and enclosures to determine space required for mounting. In addition, sufficient clearance must be provided at the front of the fan coil to allow access to electrical controls and removal of the motor/blower assembly for servicing. This clearance distance should be approximately the same as the depth dimension of the fan coil unit.

NOTE

A field-fabricated secondary drain pan, with a drain pipe routed to the outside of the building, may be required when the fan coil unit is above a finished living space or in any area that may be damaged by water overflow from the main drain pan.

AIR DISTRIBUTION DUCTS

All duct work must be installed in accordance with National Fire Protection Association Codes 90A and 90B. Ducts should be adequately insulated to prevent condensation during the cooling cycle and to minimize heat loss during the heating cycle. All return air must be filtered to prevent dirt buildup on the coil surface. If there is no ducted return, applicable installation codes may limit the unit to installation only in a single-story residence. In many cases it is acceptable to use ducting of the same size as the fan coil connections. However, unique arrangements or long duct runs must be confirmed by a local professional. The manufacturer will not be responsible for misapplied equipment. Supply and return duct system must be adequately sized to meet the system's air requirements and static pressure capabilities. The duct system should be insulated with a minimum of 1 in. insulation with a vapor barrier in conditioned areas or 2 in. minimum, in unconditioned areas.

WARNING

Units are very heavy. Use two or more people when moving and installing these units. Failure to do so could result in personal injury or death.

Use gloves when handling equipment. Contact with metal edges and corners while applying excessive force can result in personal injury. Use caution during installation or while servicing equipment.

CAUTION

The duct system including filter, registers, and louvers must not exceed the external static pressure listed on the unit rating plate.

ELECTRICAL

Field installed electrical wiring supplying power to this unit and or electric heaters must include a disconnect device at the unit.

WARNING

ELECTRIC SHOCK HAZARD

Disconnect all power supplies before servicing; lock out/tag out to prevent accidental electrical shock. Note: there may be multiple power sources.

- Use copper conductors only.
- Install all parts and panels before operating.
- Failure to follow these warnings can result in injury or death.

All wiring must comply with local and national code requirements. Units are provided with wiring diagrams and nameplate data to provide information required for necessary field wiring. Refer to Figure 2 - Auxiliary Float Switch Installation for points of entry of the wiring into the cabinet.

WARNING

Electrical work associated with the installation of this appliance must comply with the National Electrical Code (NEC). Other local or regional electrical and building code requirements may apply.

In Canada electrical work associated with the installation of this appliance must comply with CSA CEC22.1.

ELECTRICAL OVER CURRENT PROTECTION HACR type breakers are recommended. Overcurrent protection devices that comply with all applicable codes are acceptable.

These units are provided with a Class 2 transformer for 24-volt control circuits. Should any add-on equipment also have a Class 2 transformer furnished, care must be taken to prevent interconnecting outputs of the two transformers by using a thermostat with isolating contacts.

Heater kits are approved only for installation in "0 KW Heater kit compatible models" models. Field installed heater kits are not approved for installation in units built with factory installed heaters.

WARNING

ELECTRIC SHOCK HAZARD

Transformers are multi voltage, it is crucial to refer to unit wiring diagram, transformers wiring diagram as well as unit voltage to ensure proper connections and operation safety.

WATER PIPING

These units employ a hydronic coil designed for use with either hot or chilled water.

- All piping must be adequately sized to meet the design water flow requirements as specified for the specific installation.
- The piping connections on the equipment are not necessarily indicative of the proper supply and return line sizes. Piping design should be kept as simple as possible.
- Piping must be installed in accordance with all applicable codes.
- Prior to connecting to the fan coil, all external piping must be purged of debris.
- All chilled water piping must be insulated to prevent property damage from condensation. It is also recommended that all piping be insulated to prevent freezing when piping is located in an unconditioned space.

CAUTION

When connecting piping to fan coil units, do not bend or reposition the coil header tubing for alignment purposes. This could cause a tubing fracture resulting in a water leak when pressure is applied to the system.

NOTE

A field-fabricated secondary drain pan, with a drain pipe routed to the outside of the building, may be required when the fan coil unit is above a finished living space or in any area that may be damaged by water overflow from the main drain pan.

NOTE

Coil freeze protection is recommended for applications where the fan coil is located in low ambient temperature locations (attics, crawl spaces) or within structures that may be unoccupied during freezing conditions. Consult the factory for additional information.

NOTE

Many valve packages will not physically allow all components to fit over an auxiliary drain pan. It is the installers responsibility to insulate all piping to ensure adequate condensation prevention.

CONDENSATE PIPING

Condensate drain lines must be installed with adequate slope away from the unit to assure positive drainage. Since the drain pan is located on the suction side of the blower, a negative pressure exists at the drain pan. Fan coil units require a minimum trap of 1.5 in. provided in the drain line to assure proper drainage.

WARNING

On units with plastic drain pans the drain connections must be made hand-tight only.

A condensate switch may be installed in lieu of an auxiliary drain line if permitted by local code.

SOUND QUALITY

These fan coil units are designed for quiet operation; however, all air conditioning equipment will transfer some amount of noise to the conditioned space. This should be taken into consideration when planning the location of the equipment.

LEAK CHECK

These units employ a hydronic coil designed for use with either hot or chilled water. All coils are factory pressure-tested to 350 PSIG prior to shipment, with a maximum working pressure of 250 PSIG.

All field piping should be copper and properly sized to meet the design water flow requirements for the specific installation, and must be installed in accordance with all applicable codes. Note that the piping connections provided on the unit do not necessarily indicate the proper supply and return line sizes. To minimize restrictions and ensure performance, piping layouts should be kept as simple and direct as possible.

During installation, the contractor shall perform a field hydrostatic leak test of all piping and coil connections by pressurizing the system with water to 1.1–1.5 times the design working pressure (not exceeding the maximum rating of any component), maintaining pressure for at least 10 minutes, and carefully inspecting all joints and fittings for leakage. Record test results, repair, and re-test as necessary prior to placing the unit in service.

OPERATION & MAINTENANCE

WARNING

ELECTRIC SHOCK HAZARD

Electrically ground the fan coil. Connect the ground wire to the terminal marked with the ground symbol, ⏚. Failure to properly ground the unit could result in injury or death. Always disconnect power before servicing and verify power is off to prevent accidental shock.

CAUTION

Devices such as fan switches or thermostats provided for field installation must be wired according to the supplied wiring diagram. Failure to do so could result in damage to components and void the warranty.

WARNING

ELECTRIC SHOCK HAZARD

Disconnect all power supplies before servicing. Lockout/tagout to prevent accidental shock. Ensure all personal protective equipment is worn when servicing or maintaining the unit.

PRE-START CHECK

Before starting the unit:

1. Ensure supply voltage matches the nameplate data.
2. Verify the unit is properly grounded.
3. Check blower wheel set screws for tightness and ensure blower wheels rotate freely and quietly.
4. Ensure the fan coil is securely installed and sloped toward the drain line.
5. Verify the condensate line is properly sized, run, trapped, pitched, and tested.
6. Ensure a clean filter is installed and access panels are secured.
7. Check that water coil connections and piping are leak-free and properly insulated.
8. Seal any knockouts, penetrations, or exposed holes to maintain low air leakage.

OPERATION & MAINTENANCE (continued)

WARNING

ELECTRIC SHOCK HAZARD

Transformers are multi voltage, it is crucial to refer to unit wiring diagram, transformers wiring diagram as well as unit voltage to ensure proper connections and operation safety.

START-UP AND MAINTENANCE

Before start-up, perform the following checks:

- Clean all components of debris to prevent operational issues.
- Ensure all access panels and filters are properly installed.
- Verify unit cleanliness and secure all rotating components.

MAINTAINING LOW LEAKAGE RATE

During installation, ensure that all grommets and gaskets remain intact on all surfaces as shipped with the unit. Any knockouts, penetrations, and holes that were exposed must be sealed to prevent air leakage. All access panels and covers must be flush with each other and the cabinet. With these requirements satisfied, the unit will maintain and achieve less than 2% air flow leakage when tested in accordance with ASHRAE Standard 193.

FAN

Inspect and clean the fan annually in conjunction with motor and bearing maintenance. Keep wheels clean to avoid imbalance and vibration.

MOTOR

Check motor connections for security and compliance with wiring diagrams. For ECM motors, ensure power is disconnected before servicing, as line voltage is always present.

FILTER

Replace or clean the air filter every 30 days or more frequently under severe conditions. Use the same type as originally furnished.

COIL

Clean dust or contaminants from heat transfer surfaces using one of the following methods:

- Low-pressure compressed air.
- Flushing with water (use a detergent for greasy surfaces).

DRAIN PIPING

Ensure the drain is:

- Properly connected and sloped away from the unit (1/8 in. per foot minimum).
- Checked before summer operation and periodically during operation.

MAINTENANCE UPDATES

Contact factory for current Maintenance Program information.

Drain pan overflow protection switches may be attached to the drain fitting cover using the following technique illustrated below. Refer to **Figure 2 - Auxiliary Float Switch Installation**.

- Remove drain fitting cover, 3 screws.
- Using pliers, bend flange out at its attachment point.
- Reinstall cover.
- Clip switch assembly behind the step on the flange, alligator clip.
- Route a red low voltage wire from junction box red pig tail to switch.
- Add another red 18 gauge or larger lead back from the switch onward to the thermostat as done normally.

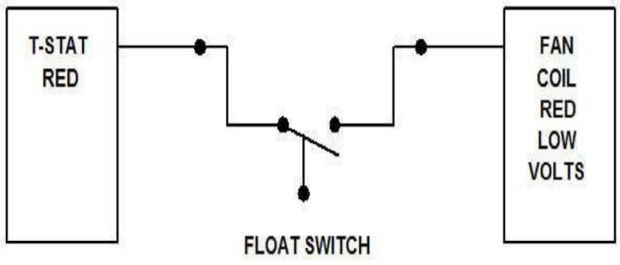

Figure 1 - Float Switch

OPERATION & MAINTENANCE (continued)

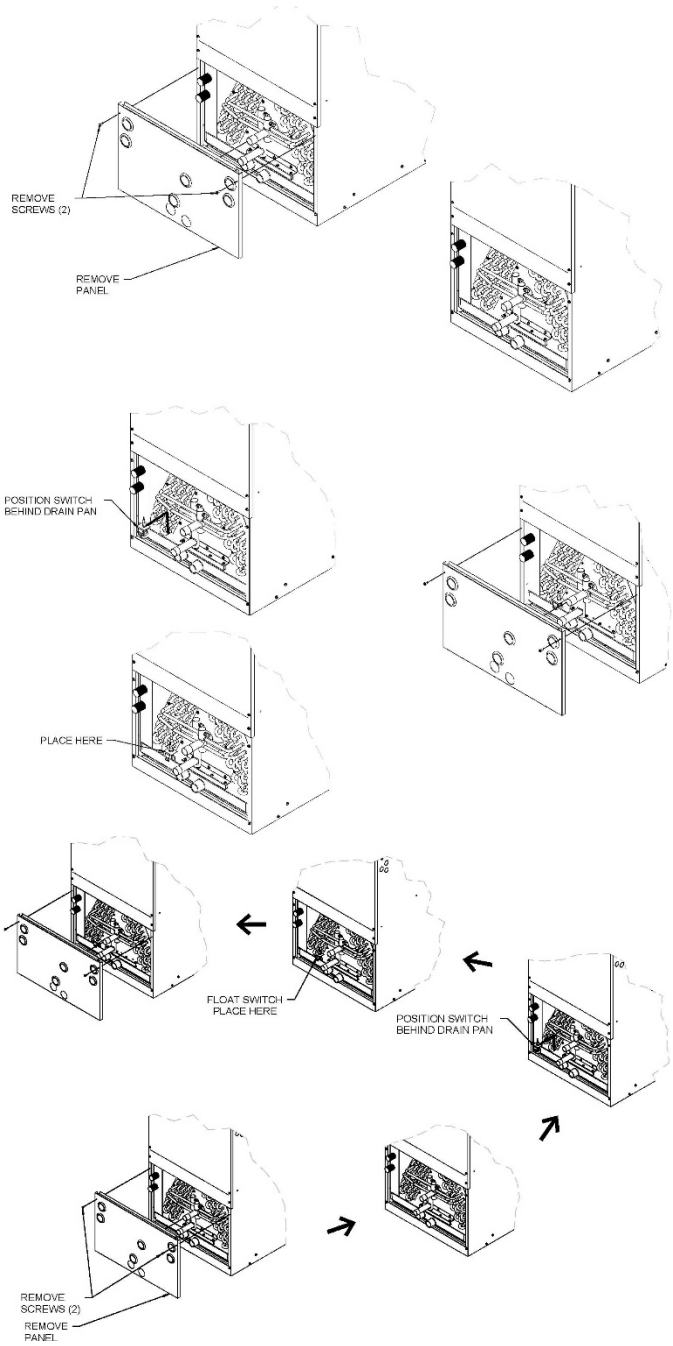

Figure 2 - Auxiliary Float Switch Installation

QUALIFICATION OF WORKERS

Service shall only be performed by qualified technicians, certified by national training organizations or manufacturers that are accredited to teach the relevant national competency standards that may be set in legislation. Competence to properly service the appliance should be documented by a certificate.

CHECKS TO THE WORK AREA

Prior to beginning work on the appliance, safety checks are necessary to ensure that the risk of ignition of released gasses is minimized. Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present 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.

VENTILATED AREA

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

OPERATION & MAINTENANCE (continued)

CHECKS TO ELECTRICAL DEVICES AND SEALED ELECTRICAL COMPONENTS

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial Safety Checks shall include:

- That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- That no live electrical components and wiring are exposed while charging, recovering, or purging the system;
- That there is continuity of earth bonding.

Sealed electrical components shall be replaced in the event of damage or malfunction.

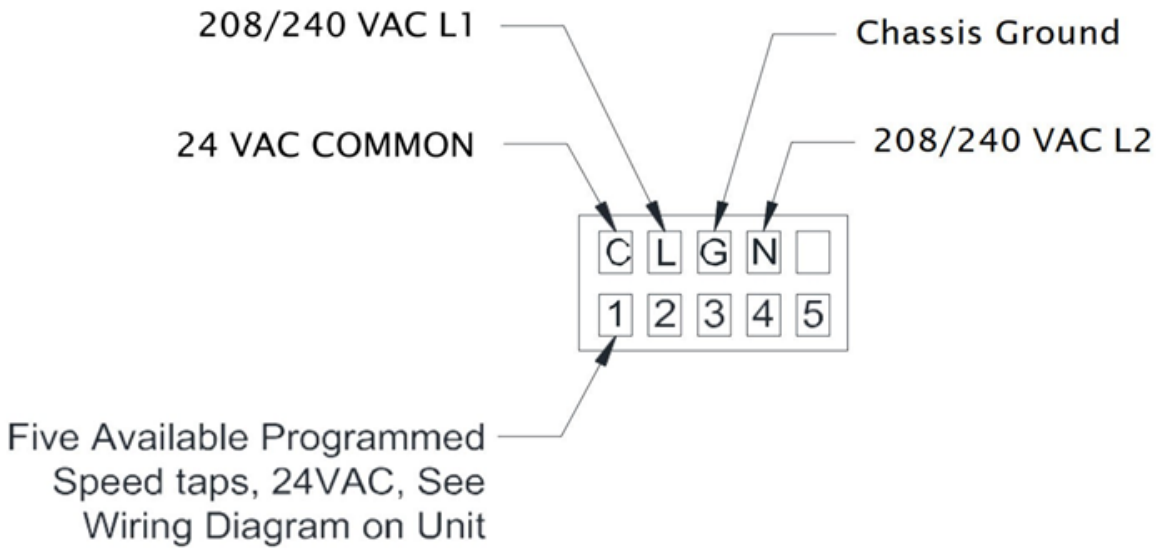

Figure 3 – Speed Tabs

PHYSICAL DIMENSIONS

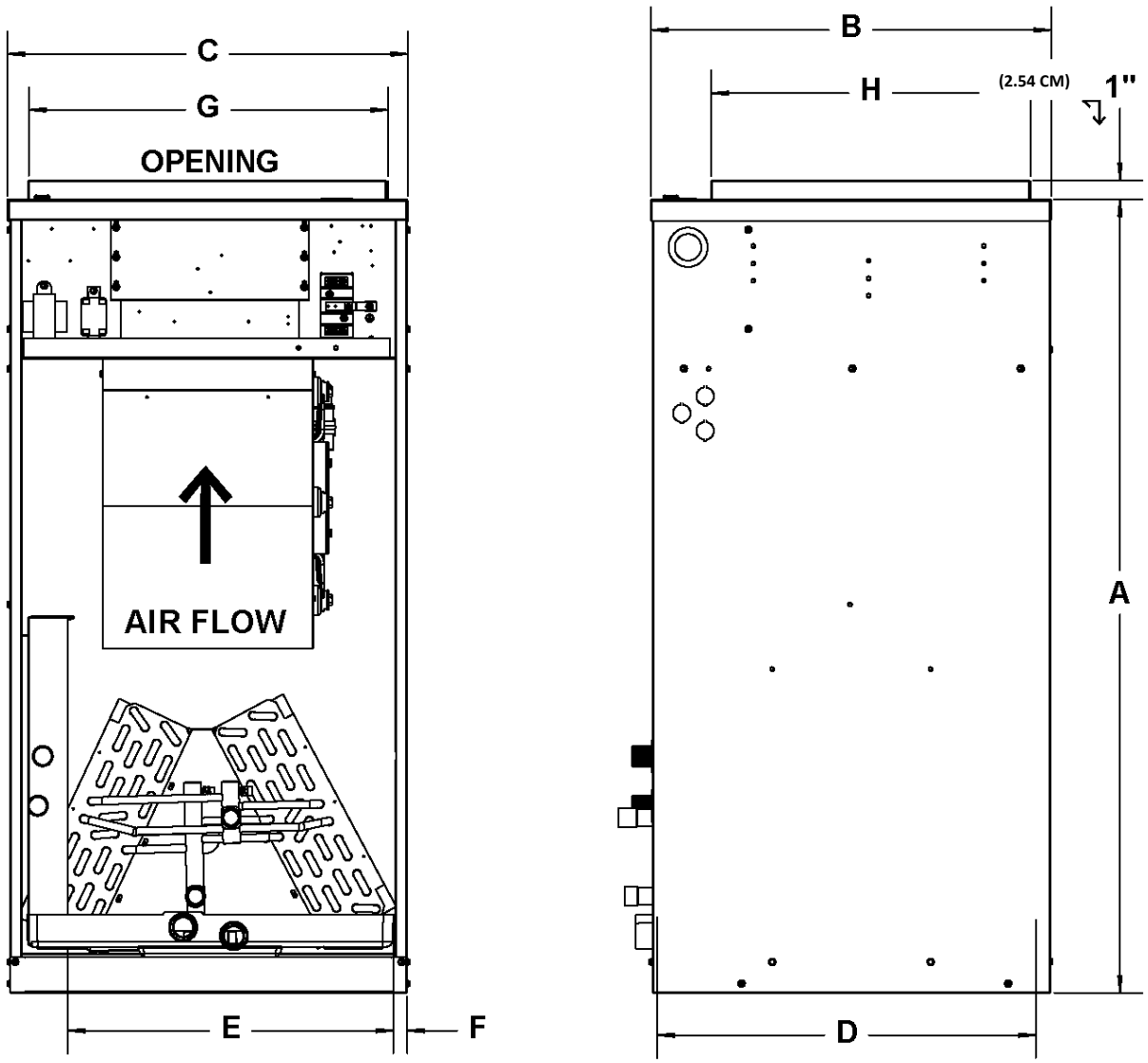

Figure 4 - Unit Physical Dimensions

Unit Physical Dimensions in. (cm)											
Unit Model	A	B	C	D	E	F	G	H	Coil Connections	Filter Size	Ship Wt. lbs. (kg.)
8 MB	40 (101.6)	20 (50.8)	20 (50.8)	18.50 (47)	16 (40.6)	2 (5.08)	18 (45.7)	16 (40.6)	7/8" SWEAT (2.2)	18 x 20 x 1 (45.7 x 50.8 x 2.54)	115 (50.8)
12 MB	42 (106.7)	23 (58.4)	20 (50.8)	21.50 (54.6)	16 (40.6)	2 (5.08)	18 (45.7)	17 (43.2)	7/8" SWEAT (2.2)	20 x 22 x 1 (50.8 x 55.9 x 2.54)	120 (54.4)
16/20 MB	48 (122)	28 (71.1)	21.25 (54)	26.25 (66.67)	17.25 (43.8)	2 (5.08)	19.25 (48.9)	18 (45.7)	1-1/8" SWEAT (2.86)	20 x 25 x 1" (50.8 x 63.5 x 2.54)	210 (95.3)
20 MB-HW	52 (132)	28 (71.1)	25.25 (64.1)	26.50 (67.3)	21.25 (54)	2 (5.08)	22 (55.9)	24 (61)	-	14 x 24 x 1 (35.56 x 61 x 2.54) 2 required	260 (118)

TABLE 1 – UNIT PHYSICAL DIMENSIONS

NOTES

P.O. Box 270969 Dallas, TX 75227
www.firstco.com or www.ae-air.com