Installation, Operation, & Maintenance

IOM 6504
Rev. A 12/25

UCS*
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 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.

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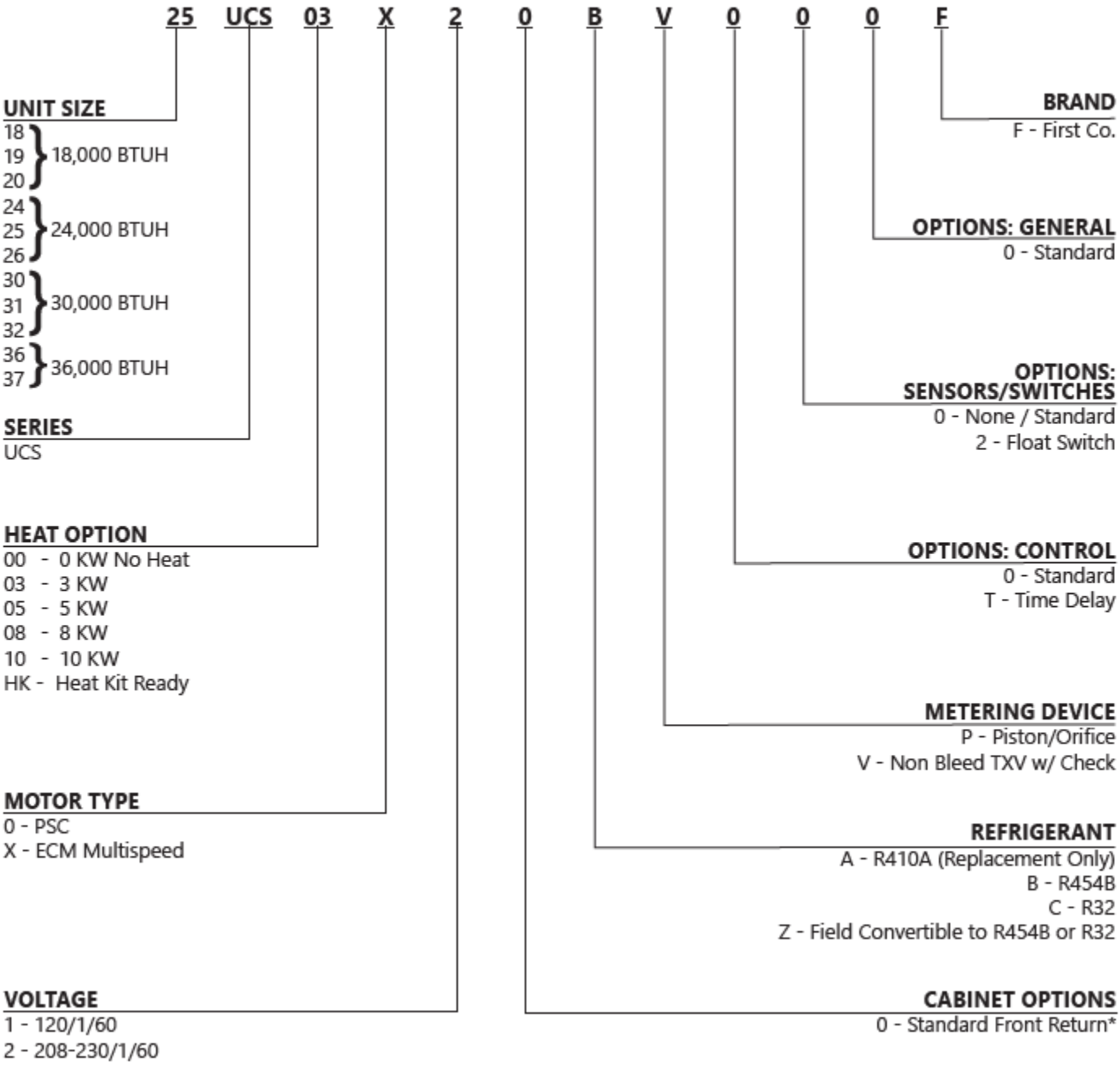
NOMENCLATURE



*Field converted bottom return is achieved by removing the bottom panel and installing it on lower front of cabinet.

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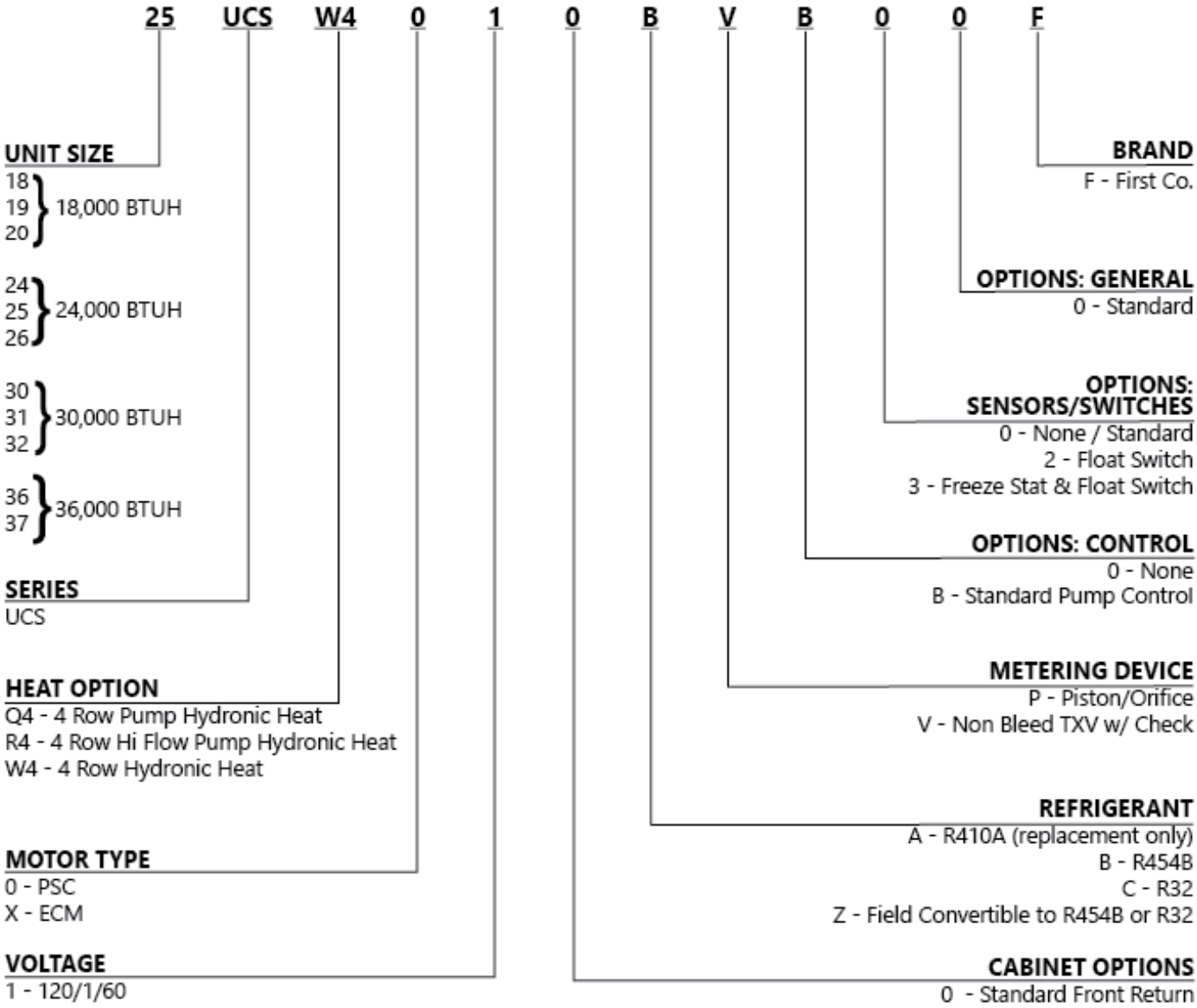


*Field converted bottom return is achieved by removing the bottom panel and installing it on lower front of cabinet.

SAFETY CONSIDERATIONS

1. READ THE ENTIRE MANUAL BEFORE STARTING THE INSTALLATION.
2. These instructions are intended as a general guide and do not supersede, national, state, or local codes in any way.
3. Any product alteration, improper installation, or use of unauthorized parts will void all warranties expressed or implied and may result in poor performance, equipment malfunction or hazardous conditions for service personnel and occupants. Company employees or contractors are not authorized to waive this warning.
4. This product should only be installed and serviced by a qualified, licensed, and factory authorized installer or service agency.
5. All “kits” and “accessories” used must be factory authorized when modifying this product. Refer to and follow the instructions provided with each kit or accessory during installation.

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

This warning 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.

WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly may result in property damage, hazardous operation, serious injury, or death. Improper servicing can also lead to dangerous conditions, injury, death, or property damage.

- Disconnect all electrical power to the unit before servicing.
- Label all wires prior to disconnecting controls and ensure correct reconnection.
- Verify proper operation after servicing.

	Service indicator; read technical manual.
	Operator’s manual; operating instructions.
	Read the instructions.
	Warning; flammable materials.
	UN GHS flame symbol

ATTENTIONS, CAUTIONS, & WARNINGS

WARNING

Risk of fire. Flammable Refrigerant Used. Repairs must be performed only by trained service personnel. Do not puncture or damage refrigerant tubing. Do not install auxiliary devices that could serve as ignition sources in the ductwork, except for those specifically listed for use with this appliance. Refer to the installation instructions for details.
Dispose of refrigerant properly in accordance with all federal and local regulations.

WARNING

When a Refrigerant Leak Detection System (RDS) is installed, the unit must remain powered at all times, except during service. The installer must verify that the refrigerant sensor is properly installed and fully operational. Failure to do so will void the warranty and may result in fire, property damage, or death.

WARNING

Exercise extreme caution when installing or servicing systems containing flammable refrigerants. Control the work environment to minimize the risk of ignition and ensure all personnel on site are informed of the hazards and required safety precautions.

WARNING

These instructions are intended to assist qualified, licensed service personnel in the proper installation, adjustment, and operation of this unit. Read all instructions thoroughly before beginning installation or operation.

Failure to follow these instructions may result in improper installation, adjustment, service, or maintenance, which could lead to fire, electrical shock, property damage, personal injury or death.

WARNING

ELECTRIC SHOCK HAZARD

Before servicing or performing maintenance on the system, turn OFF the main power to the unit. Failure to do so may result in electrical shock, causing personal injury or death.

WARNING

Electrical work for the installation of this appliance must comply with the National Electrical Code (NEC) and any applicable local or regional electrical and building codes.

In Canada, all electrical work must comply with CSA C22.1.

IMPORTANT

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

This appliance is for INDOOR USE ONLY.

WARNING

For appliances using A2L refrigerants connected to one or more rooms via ductwork, only auxiliary devices approved by the manufacturer or specifically rated for the refrigerant may be installed in the ducts.

Auxiliary devices that could serve as ignition sources must be installed in the ductwork. Examples of potential ignition sources include electrical switching devices and hot surfaces exceeding 1,292°F [700°].

ATTENTIONS, CAUTIONS, & WARNINGS CONTINUED

WARNING

Use multiple people when moving and installing these units. Failure to do so could result in injury or death.

WARNING

A2L refrigerants can become combustible if mixed with air at elevated temperature and/or pressure. Failure to follow this warning could result in property damage and personal injury or death.

WARNING

Use tools specifically designed for A2L refrigerants. Only non-sparking tools may be used near A2L refrigerants. Open flames and other ignition sources must be avoided, except during brazing, which must be performed only on evacuated and nitrogen-purged refrigerant lines and components exposed to the atmosphere.

WARNING

When soldering or brazing, keep a dry powder or CO_2 fire extinguisher readily available. Use heat shields or wet rags to protect valves and sensitive components from heat damage during the process.

CAUTION

Contact with metal edges and corners can result injury. Protective gloves should be worn when handling. Exercise caution when installing and servicing unit.

CAUTION

Do not operate this equipment without an air filter.

CAUTION

Always wear all appropriate personal protection equipment when installing and servicing these units.

CAUTION

When servicing this equipment, because of high pressures, make sure the reversing valve, expansion device, filter drier and other components are specifically designed for A2L refrigerants.

ONLY USE service equipment specifically designated for use with A2L refrigerants.

CAUTION

When the unit is operating, internal components rotate at high speeds. Avoid contact to prevent personal injury.

CAUTION

Do not operate these units for heating or cooling during construction. Dirt and Debris can clog mechanical components and filters, potentially causing system damage. Do not operate these units without a filter.

The manufacturer does not warrant equipment subjected to misuse.

NOTE

Insulation provides a barrier between the unit's internal environment and external conditions. Damaged insulation can lead to condensation, corrosion, component failure, and potential property damage. Repair or replace any damaged insulation before operating the unit. Note that insulation loses effectiveness when wet, torn, separated, or otherwise compromised.

ATTENTIONS, CAUTIONS, & WARNINGS CONTINUED

IMPORTANT

Dispose of refrigerant in accordance with all applicable federal, state, and local regulations.

WARNING

Failure to follow proper A2L refrigerant mitigation system installation procedures may result in property damage, personal injury, or death. If any fault indicators are present, troubleshoot the system immediately to prevent malfunction.

WARNING

When the unit contains flammable refrigerant and is installed in a room smaller than the minimum specified in the Minimum Room Size and Mitigation Airflow section, the room must be free of continuously operating open flames or other potential ignition sources.

IMPORTANT

The Clean Air Act of 1990 prohibits the intentional venting of refrigerants, including CFCs and HFCs. All refrigerant recovery and reclamation must be performed using approved methods. Non-compliance may result in fines and/or imprisonment.

CAUTION

Some soaps used for leak detection can be corrosive to certain metals. Thoroughly rinse all piping after completing the leak test. Do not use matches, candles, open flames, or any other ignition sources to check for refrigerant or gas leaks.

CAUTION

Only personnel properly trained in handling A2L refrigerants may install, decommission, or perform maintenance on this unit.

NOTE

Sealed electrical and intrinsically safe components must be **replaced**, not repaired.

IMPORTANT

In addition to standard charging procedures, the following requirements must be observed:

1. Prevent cross-contamination: Ensure different refrigerants do not mix when using charging equipment. Keep hoses or lines as short as possible minimize residual refrigerant.
2. Cylinder handling: Store and position refrigerant cylinders according to the manufacturer's instructions.
3. Grounding: Verify that the refrigeration system is properly earthed before charging with refrigerant.
4. System labeling: Label the system appropriately once charging is complete.
5. Overfill prevention and leak testing: Take extreme care to avoid overfilling the system. Before recharging, pressure-test the system with an appropriate purging gas. Perform a leak test after charging but prior to commissioning. Conduct a follow-up leak test before leaving the site to ensure system integrity.

CAUTION

Decommissioned equipment must be labeled to indicate that it has been emptied of refrigerant. Labels should include the date and signature of the technician. For appliances containing flammable refrigerants, additional labels must clearly state that the equipment contains a flammable refrigerant.

NOTE

Ensure cabling is protected from wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental conditions.

ATTENTIONS, CAUTIONS, & WARNINGS CONTINUED

NOTE

This unit includes an earth connection for functional purposes only and is not intended as a primary safety ground.

IMPORTANT

Perform all work under a controlled procedure to minimize the risk of flammable gas or vapor being present during service.

IMPORTANT

Before and during service, check the area with an appropriate refrigerant detector to monitor for toxic or flammable atmospheres. Ensure that all leak detection equipment used is suitable for the refrigerants involved – non-sparking, properly sealed, or intrinsically safe.

WARNING

For duct-connected appliances, a false or drop ceiling may serve as a return-air plenum only if the appliance is equipped with a Refrigerant Detection System (RDS). Any external duct connections must also be monitored with a sensor installed immediately below the return-air plenum joint.

CAUTION

Anyone performing work on a refrigerating system that exposes piping must not use any sources of ignition that could cause fire or explosion. All potential ignition sources, including smoking, must be kept well away from the work area during installation, repair, removal, or disposal, when refrigerant may be released. Before starting work, survey the area to ensure no flammable hazards or ignition risks are present.

IMPORTANT

Ensure the work area is either open or adequately ventilated before opening the system or performing any hot work. Maintain sufficient ventilation throughout the duration of the work.

CAUTION

Repair and maintenance of electrical components must include thorough safety checks and inspections, including:

- Ensuring capacitors are safely discharged to prevent sparking.
- Confirming no live electrical components or exposed wiring are present during system charging, recovery, or purging.
- Verifying continuity of earth bonding.

If a fault is detected that could compromise safety, do not connect electrical power until the issue is resolved. If the fault cannot immediately corrected but operation must continue implement an adequate temporary solution and inform the equipment owner to ensure all parties are aware.

IMPORTANT

Improper installation, adjustment, modification, service, or maintenance may result in property damage, personal injury, or death. All installation and service must be performed by a licensed HVAC professional, authorized service agency, or gas supplier.

ATTENTIONS, CAUTIONS, & WARNINGS CONTINUED

IMPORTANT

When replacing electrical components, ensure they are suitable for the intended purpose and meet the correct specifications. Always follow the manufacturers maintenance and service guidelines. If in doubt, consult the manufacturer's technical department.

For installations using flammable refrigerants, the following checks must be applied as applicable:

- Verify that the actual refrigerant charge is appropriate for the room size where refrigerant-containing components are installed.
- Confirm that ventilation systems and outlets are functioning properly and are not obstructed.
- For indirect refrigerant circuits, ensure the secondary circuit contains no unintended refrigerant.
- Ensure all equipment markings remain visible and legible. Replace or correct any markings or signs that are illegible.
- Install refrigerant piping and components in locations where they are unlikely to be exposed to corrosive substances, unless the components are made of corrosion-resistant materials or are adequately protected.

GENERAL

The manufacturer does not warrant equipment subjected to abuse. Contaminants such as metal chips, dust, drywall tape, or paint overspray may void warranties and relieve the manufacturer of liability for equipment failure, personal injury, or property damage. The manufacturer also assumes no responsibility for equipment installed in violation of applicable codes.

These instructions apply only to the installation of UCS* fan coil units. For other related equipment, refer to the respective manufacturer's instructions.

All materials in this shipment have been factory inspected and released in good condition. Upon receipt, perform a visual inspection of all cartons immediately. Any signs of rough handling or apparent damage must be noted on the delivery receipt, and the contents inspected in the presence of the carrier's representative. If damage is discovered, file a claim with the carrier immediately.

CAUTION

Take extreme care when drilling or installing screws to avoid causing internal damage to the cabinet.

LOCATION and CLEARANCE

Select a location that provides adequate space for mounting and allows for proper duct connections. A recommended clearance of 24 inches on all sides should be maintained for service access. Units may be installed with 0" clearance to combustible materials; however, always verify the specific clearance requirements listed on the units rating plate.

In locations where the unit may be subjected to physical damage (such as a garage), a protective barrier is recommended. Install the unit with a positive condensate-line slope of 1/4 inch per foot to ensure proper drainage.

All joints made during installation between components of the refrigerant system must remain accessible for maintenance. Consult all applicable codes and regulatory guidelines when determining final clearances and completing the installation.

WARNING

Only use defrosting or cleaning methods recommended by the manufacturer.

Store the appliance in a room free of continuously operating ignition sources (e.g., open flames, gas appliances, or electric heaters).

Do not pierce or burn the appliance.

Be aware that refrigerants may be odorless and may not provide a detectable warning if released.

FAN COIL UNIT

INSTALLATION REQUIREMENTS

- The installer must comply with all applicable local and national codes when installing this equipment.
- Units are designed for indoor installation only and are agency listed for zero clearance to combustible materials, including the fan coil cabinet, discharge plenum, and connecting ducts.
- These fan coil units are intended to be installed vertically in the up-flow position using the recommended mounting methods.
- Provide sufficient front clearance to access electrical controls and to remove the motor/blower assembly for servicing. This clearance should be approximately equal to the depth of the fan coil unit.

NOTE

If a condensate overflow shut-off switch designed for installation in the drain line is used instead of a secondary drain line, install it in the primary drain line between the fan coil and the P-trap.

REFRIGERANT SYSTEM SERVICING

Tools required for installing and servicing A2L units.
Manifolds sets:

- Up to 600 PSIG High Side (41 bar)
- Up to 250 PSIG Low Side (17 bar)

WARNING

When soldering or brazing, always keep a fire extinguisher readily available. When working near valves or other sensitive components, use heat shields or wet rags to protect these parts from heat exposure. Failure to protect components during soldering or brazing can result in damage to valves and other critical parts, leading to equipment malfunction or unsafe operating conditions.

WARNING

Do not exceed the maximum operating pressure listed on the unit rating plate.

IMPORTANT

Do not open the service valves until the evaporator section and all connecting tubing have been installed, leak-tested, and properly evacuated. Service valves are to be opened only when the system is fully prepared for operation. Premature opening may result in refrigerant loss, contamination, or system damage.

WARNING

Always recover all refrigerant before performing any repairs on a sealed air-conditioning system and before final disposal of the unit. Ensure that all service ports are used and that every refrigerant flow-control device—including expansion valves and solenoid valves—is fully open. Failure to follow these procedures may result in serious injury or death.

WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow these instructions could result in personal injury, death, or property damage.

Do not attempt any sealed system repair without first recovering the entire refrigerant charge. A2L refrigerant mixed with oil can ignite when exposed to a brazing torch flame. Always recover the full refrigerant charge from both the high and low sides of the system, and purge the sealed system with nitrogen before brazing any component or tubing.

REFRIGERANT SYSTEM SERVICING CONTINUED

All piping must be protected from physical damage during operation and service and comply with all applicable national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. Field joints must remain accessible for inspection before being covered or enclosed.

When routing lines from the evaporator coil to the condensing unit, keep them as short as possible, with a maximum allowable length of 50 ft (15 m). Knockouts are provided at both upper corners and on each side of the unit cabinet for line entry; only remove the openings needed and seal any unused openings to prevent air leakage, which can reduce airflow over the condenser coil. Service valves are designed for sweat connections— avoid overheating the valve by using a wet cloth for protection during brazing. Ensure that line routing does not obstruct removal of the motor or fan through the access panel or block access panel removal.

The suction line must be insulated to prevent condensation, using insulation with a minimum wall thickness of 0.38 in. (9.5 mm) and an adequate vapor barrier, extending a few inches (50–100 mm) inside the unit cabinet to contain any condensation safely.

A2L Sensor Replacement Procedure

1. Remove the front bottom panel to access the coil.
2. Disconnect the A2L harness from the currently installed sensor.
3. Remove the existing A2L sensor from its bracket by loosening the two mounting screws (see Figure X below). Reuse these screws to install the new sensor.
4. Mount the new sensor onto the bracket using the two existing screws. CAUTION: Do not screw into the coil or tubing. (Refer to Figure 1.)
5. Reconnect the A2L harness to the newly installed sensor.

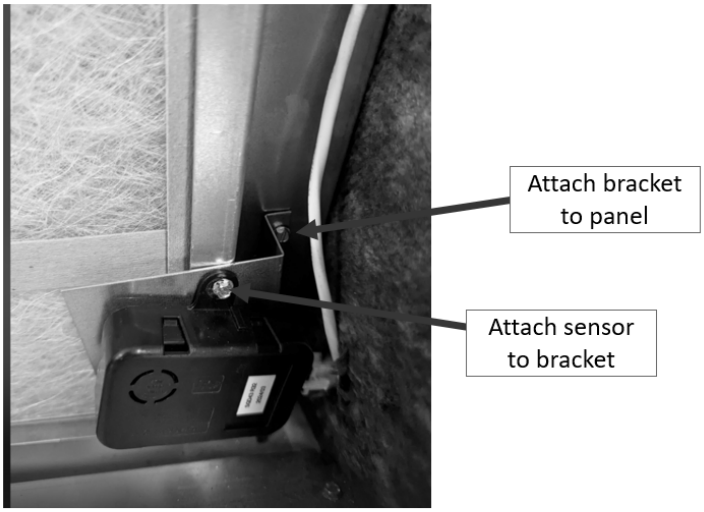


Figure 1 - Sensor Mounting

REFRIGERANT SYSTEM SERVICING CONTINUED

WARNING

FIRE OR EXPLOSION HAZARD

Do not use open flames or any potential ignition sources when performing leak checks on refrigerant tubing or components. Failure to comply with this instruction may result in personal injury, death or property damage.

Connect the suction and liquid hoses from the gauge manifold to the service ports on the services valves. A hole covered by a plastic snap plug is provided for gauge hose entry, allowing the unit access panel to be reinstalled without disturbing the hoses. Once the gauge hoses are removed, ensure the plastic plug is replaced to cover the service hole. Connect a cylinder of dry nitrogen to the gauge manifold valves. After the system reaches balanced pressure, perform a leak test on all sweat fittings. If any leaks are detected, repair them, and repeat the procedure.

WARNING

It is a violation of federal law to discharge refrigerant into the atmosphere. Always use approved reclaiming methods and certified equipment when installing or servicing this unit. This service must be performed by a qualified agency. A sealed refrigerant system is designed to be closed and self-contained and typically requires no routine maintenance.

WARNING

FIRE OR EXPLOSION HAZARD

Never use an open flame to test for refrigerant leaks. Always use a commercially available soap solution specifically designed for leak detection to check all connections. Failure to follow this instruction may result in fire or explosion causing property damage, serious injury, or loss of life.

Strict adherence to these safety warnings is required to prevent severe injury, death, or property damage.

EVACUATION & SYSTEM PREPARATION PROCEDURE

1. Determine Evacuation Requirement
   Evacuation of the condensing unit is not necessary unless the unit has lost its refrigerant charge. If the charge is intact, leave the service valves closed.
2. Recover Refrigerant
   Recover the refrigerant from the evaporator coil and connecting tubing only.
3. Connect Vacuum Pump
   Attach the Vacuum pump to the charging port on the gauge manifold.
4. Start Evacuation
   Start the vacuum pump and open the suction hand valve on the gauge manifold.
5. Achieve Target Vacuum
   Allow the pump to operate until a vacuum of 300 microns is reached.
6. Check Pressure Stability
   Shut off the vacuum pump and monitor the system pressure.
   - If the pressure rises above 500 microns, restart the pump, and continue evacuation until the system can maintain 500 microns or lower.
7. Secure System
   Close the hand valves on the gauge manifold and disconnect the vacuum pump.
8. Open Service Valves
   Open the service valves on the condensing unit.
9. Verify Readiness
   The refrigeration system is now prepared for normal operation.

LEAK CHECK

After installing refrigerant piping, perform a leak check using nitrogen at a minimum of 200 psig. Pressure must remain stable for at least 1 hour.

Avoid using leak detection fluids or devices that could corrode copper tubing.

Evacuate suction and liquid lines at the outdoor unit service valves to 500 microns. Isolate the vacuum pump from the system and verify that the vacuum does not exceed 1500 microns within 10 minutes.

REFRIGERANT SYSTEM SERVICING CONTINUED

REFRIGERANT CHARGING & FLAMMABLE REFRIGERANT SAFETY

WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow this warning may result in personal injury, death, or property damage.
Do not use open flames or any potential ignition sources to check for refrigerant leaks.

IMPORTANT

All metering devices installed in the refrigerant circuit must be compatible with the specific refrigerant in use.

Use appropriate personal protective equipment (PPE), including eye and hand protection, when handling refrigerant. Follow the outdoor unit manufacturer's charging instructions. Consider all relevant factors when determining the charging method and refrigerant quantity, including:

- Indoor and outdoor temperatures and humidity
- Factory charge of the outdoor unit
- Length and diameter of the tubing between indoor and outdoor units
- Type of metering device installed

WARNING

Discharging refrigerant into the atmosphere is prohibited by law. Always use approved recovery and reclaiming equipment when installing or servicing this unit. Only a qualified service agency should perform these procedures.

WARNING

IMPROPER REFRIGERANT HANDLING CAN CAUSE INJURY, EXPLOSION, OR DEATH

- Release of refrigerant into the atmosphere is illegal. Refrigerant in an enclosed space can displace oxygen, leading to unconsciousness or death.
- Suspected indoor refrigerant leaks must be ventilated thoroughly before any work is performed. Do not purge or release refrigerant indoors.
- Contact with liquid refrigerant can cause frostbite or blindness. Always wear goggles and gloves. Seek immediate medical attention if refrigerant contacts skin or eyes.
- Do not burn refrigerant; toxic gases will form.
- Only EPA-certified (or ODP/ODS-certified in Canada) technicians are permitted to handle refrigerants.
- Follow all applicable federal, state, provincial, and local regulations.

WARNING

REFRIGERANT CYLINDER SAFETY

- Explosion hazard: recover refrigerant only in cylinders designed for this purpose.
- Do not use damaged or expired cylinders.
- Never apply flame or excessive heat to a refrigerant cylinder.
- Do not fill cylinders beyond 80% of their rated capacity.
- Use cylinders only for their intended purpose.
- Always use recovery equipment compatible with the refrigerant being recovered.
- Ensure refrigerant cylinders are properly earth-grounded before use.

REFRIGERANT SYSTEM SERVICING CONTINUED

Follow Outdoor Unit Manufacturer Instructions

- When adding refrigerant to a partially charged system, always follow the outdoor unit manufacturer's instructions.

Flammable Refrigerant Leak Detection

- Never use potential ignition sources, such as halide torches or open flames.
- Acceptable leak detection methods:
  - **Electronic Leak Detectors**: Ensure the device is suitable for flammable refrigerants, recalibrated as necessary in a refrigerant-free area. Set detection to a percentage of the refrigerant's Lower Flammability Limit (LFL), max 25%.
  - **Leak Detection Fluids**: Bubble method or fluorescent agents are acceptable. Avoid chlorine-based detergents, as they can corrode copper tubing.

Important: If a leak is suspected, extinguish all open flames. For leaks requiring brazing, recover all refrigerant or isolate the system with shut-off valves. Follow proper removal and evacuation procedures.

Refrigerant Charging Instructions

- Charge the system in cooling mode only when the outdoor temperature is 60°F (16°C) or higher.
- Operate the system for at least 15 minutes between adjustments to allow pressures to stabilize.
- Systems with micro-channel outdoor coils require small adjustments of 1 oz or less due to high sensitivity.

Hot Water Coil Circulation

- If the pump is running and the water heater has reached its set point, the fan coil hot water inlet will be hot.
- If the pump is running but hot water is not circulating, open the air bleed valve briefly to purge trapped air and allow proper circulation.
- Adjust the water heater thermostat so that water entering the hot water coil reaches approximately 140°F (60°C) after system stabilization.

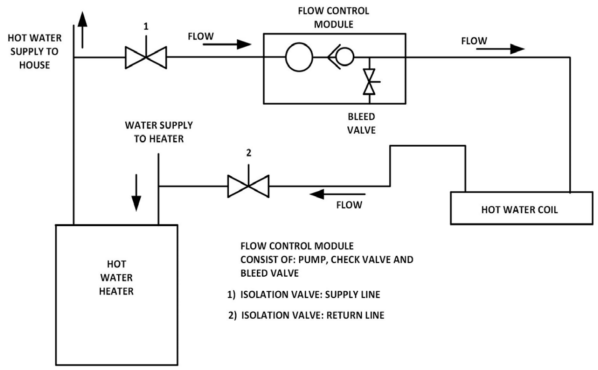


Figure 2 - Typical Piping Schematic With Flow Control Module

TXV Charging

1. Follow the outdoor unit manufacturer's instructions for refrigerant charge.
2. Air Conditioning Units: Charge to achieve 12°F (6.7°C) sub-cooling.
3. Heat Pump Units: Charge to achieve 10°F (5.6°C) sub-cooling.
4. For adjustable TXVs, adjust the valve to achieve 10°F (5.6°C) superheat.

Fixed Orifice Charging

1. Use the superheat values recommended by the outdoor unit manufacturer for A1 (R-410A) and A2L (R-454B, R-32) refrigerants.
2. Heat Pump Units: Systems initially charged in cooling mode may require final adjustments in heating mode. Follow the outdoor unit instructions for heating mode charging required.

General Guidance

- If the system is undercharged, add refrigerant until the sight glass is clear and the recommended pressures, temperatures, sub-cooling, and superheat are achieved.
- If the system is overcharged, recover refrigerant until these values are within recommended limits.

REFRIGERATION SYSTEM SERVICING CONTINUED

CHARGING PROCEDURES

In addition to standard refrigerant charging practices, the following safety and operational requirements shall be observed when handling flammable or A2L refrigerants:

- Prevent cross-contamination: Ensure that different refrigerants are not mixed when using charging equipment. Hoses and lines shall be kept as short as practical to minimize the volume of refrigerant they contain.
- Cylinder positioning: Refrigerant cylinders shall be positioned and secured in accordance with manufacturer instructions to prevent tipping, leakage, or damage.
- System grounding: Confirm that the refrigeration system is properly grounded (earthed) prior to introducing any refrigerant charge.
- System labeling: Upon completion of charging, the system shall be clearly labeled to identify the type and amount of refrigerant charged, if not already marked.
- Avoid overcharging: Exercise extreme care not to overfill the refrigeration system. Overcharging may result in excessive pressure, reduced performance, or potential hazards.

Before recharging, the system shall be pressure-tested using an appropriate inert purging gas to confirm system integrity. After charging, the system must be leak-tested before commissioning to ensure there are no leaks. A final verification leak test shall be performed prior to leaving the site.

RECOVERY

When removing refrigerant from a system for servicing or decommissioning, it is considered best practice to ensure all refrigerants are removed safely. Follow these steps:

1. Use appropriate Recovery Cylinders
   a. Transfer refrigerant only into approved recovery cylinders.
   b. Ensure you have enough cylinders to hold the entire system charge.
   c. Cylinders must be designated for the specific recovered refrigerant and clearly labeled.
   d. Each cylinder must have functioning pressure relief and shut-off valves.
2. Prepare Recovery Cylinders
   a. Empty cylinders should be evacuated and, if possible, cooled before recovery begins.
3. Check Recovery Equipment
   a. Equipment must be in good working order and suitable for flammable refrigerants.
   b. Keep the manufacturer's instructions available for reference.
   c. Use calibrated weighing scales in good condition.
   d. Hoses should have leak-free disconnect couplings and be in good condition.
4. Handle Recovered Refrigerant Properly
   a. Process refrigerant according to local legislation using the correct recovery cylinder.
   b. Arrange the relevant waste transfer documentation.
   c. Do not mix refrigerants in recovery units or cylinders.
5. Compressor and Oil Removal
   a. Ensure compressors and oils are evacuated to an acceptable level so no flammable refrigerant remains in the lubricant.
   b. Do not heat the compressor body with an open flame or any ignition source.
   c. Drain oil safely following proper procedures.

REFRIGERATION SYSTEM SERVICING CONTINUED

DECOMMISSIONING

Before decommissioning any equipment containing refrigerant, the technician shall be fully familiar with the unit design, refrigerant circuit, and all associated safety requirements. Decommissioning shall only be performed by qualified personnel following recognized industry and environmental best practices.

It is mandatory that all refrigerants be safely recovered and properly handled in accordance with local, national, and international regulations. Prior to initiating this procedure, obtain oil and refrigerant samples if laboratory analysis or reuse certification may be required.

Ensure that electrical power is available to operate recovery equipment before beginning.

A. Preparation:
    1. Review the unit's operation, electrical schematics, and service history to ensure complete familiarity with the system.
    2. Electrically isolate the system by disconnecting and locking out all power sources.
    3. Before beginning recovery operations, confirm that:
        i. Suitable mechanical handling equipment (e.g., lifting devices or trolleys) is available for refrigerant cylinders.
        ii. All required personal protective equipment (PPE) is available and worn properly.
        iii. The recovery operation will be continuously supervised by a qualified technician.
        iv. Recovery equipment and cylinders comply with applicable design and safety standards.
B. Recovery Process
    1. Pump down the refrigerant system, if possible, to minimize the amount of refrigerant in the active circuit.
    2. If achieving a vacuum is not possible, install a manifold system to enable refrigerant recovery from multiple points within the circuit.
    3. Place each recovery cylinder on calibrated weighing scales prior to initiating recovery to monitor fill levels accurately.
    4. Start the recovery unit and operate it strictly in accordance with the manufacturer's operating instructions.
    5. Do not exceed 80% of the rated liquid volume capacity of the recovery cylinder.
    6. Under no circumstances shall the maximum working pressure (MWP) of the cylinder be exceeded, even temporarily.
C. Completion
    1. Upon completion of refrigerant recovery:
        i. Close all isolation valves on the system and recovery cylinders.
        ii. Clearly label cylinders with the type and quantity of refrigerant recovered.
        iii. Remove recovery equipment and filled cylinders from the site promptly.
    2. Ensure all components containing refrigerant are sealed or capped to prevent leakage.
    3. Recovered refrigerant shall not be reused in another refrigeration or air-conditioning system unless it has been properly reclaimed, purified, and certified in accordance with applicable environmental standards.

GENERAL DATA

General Data UCS* w/Electric Heat						
Model	18/19/20UCS*	24/25/26UCS*	30UCS*	31UCS*	32UCS*	36/37UCS*
Voltage	208-230/120V					
Refrigerant	R454B/R32/R410A[1]					
Nominal SCFM	600	800	1,000	1,000	1,000	1,200
COOLING PERFORMANCE						
Nominal Capacity	18,000	24,000	30,000	30,000	30,000	36,000
OPERATING CONDITIONS						
Max. Static Pressure (in. w.g.)	0.5					
PHYSICAL DATA						
Evaporator Blower Motor	208-230V					
	1/3 ECM		1/2 ECM			
	1/6 PSC	1/4 PSC				1/2 PSC
	120V[2]					
	1/3 ECM		1/2 ECM			
	1/4 PSC	1/3 PSC				1/2 PSC
Expansion Device	TXV, Piston					
Shipping Weight lbs [kg]	88.0 [39.91]	88.0 [39.91]	98.0 [44.45]	88.0 [39.91]	98 [44.45]	98 [44.45]

Table 1

NOTES:

1. R410A available for replacement units only
2. 120V only available on units with 0kW electric heat.

General Data UCS* w/Hot Water					
Model	18/19/20UCS*	24/25/26UCS*	31UCS*	30/32UCS*	36/37UCS*
Voltage	120V				
Refrigerant	R454B/R32/R410A[1]				
Nominal SCFM	525	700	875	875	1050
COOLING PERFORMANCE					
Nominal Capacity	18,000	24,000	30,000	30,000	36,000
OPERATING CONDITIONS					
Max. Static Pressure (in. w.g.)	0.5				
PHYSICAL DATA					
ECM Motor (HP)	1/3	1/2			
PSC Motor (HP)	1/4	1/2	3/4		
Expansion Device	TXV, Piston				
Shipping Weight lbs [kg]	90.0 [40.82]		113 [51.25]		

Table 2

NOTES:

1. R410A available for replacement units only

INSTALLATION PRECAUTIONS

WARNING

Hot water can cause scalding. If the hot water coil is connected to domestic potable water, a hot water mixing valve may be installed to temper the domestic water supply.

Installation of this fan coil must be performed only by a licensed contractor to ensure proper installation and installer safety. Observe the following precautions:

- Always use the correct tools and equipment.
- Do not attempt wiring or other work without first disconnecting the fan coil from the power source and locking it out. Verify a good, permanent, uninterrupted ground before energizing any power sources.
- Review the unit nameplate and wiring diagram to ensure proper voltage and control configurations, as these may vary between units.
- When soldering or brazing, keep a fire extinguisher readily available. Use heat shields or wet rags when working near water valves or other sensitive components to prevent damage.

CAUTION

Components rotate at high speeds when the unit is operating. Avoid contact

- Install units level or with proper slope toward the drain nipple to ensure correct drainage.
- Verify condensate will drain properly. Install an overflow drain or auxiliary drain pan as a backup if the primary drain becomes clogged.
- On units with plastic drain pans, do not overtighten connections; tighten only by hand.
- Ensure the drain pan is free of foreign material prior to startup.
- Check filter installation for correct orientation, using directional arrows or other provided indicators.
- Ensure the air distribution system does not exceed the unit's external static pressure rating.

WARNING

Do not exceed the maximum operating pressure or temperature listed on the unit's rating label.

UNITS WITHOUT PUMPS:

Water Pressure:	Max 400 psig (2758 kPa)
	Min 10 psig (69 kPa)
Water Temperature:	Max 180°F (82°C)
	Min 40°F (4°C)

UNITS WITH PUMPS:

Water Pressure:	Max 125 psig (862 kPa)
	Min 2 psig (14 kPa)
Water Temperature:	Max 180°F (82°C)
	Min 40°F (4°C)

INSTALLATION

MOUNTING

Ensure fan coils are securely mounted and that the supporting structure can safely carry the equipment weight. All mounting anchors must be appropriately placed and sized for a safe, durable installation.

HUNG ON CLOSET WALL

Using mounting kit 90PK3, the air handler may be mounted on a wall. Brackets and screws are provided for both the closet wall and the air handler. It is recommended to install sound-isolating material to minimize undesired noise transfer.

RECESSED IN A WALL

For recessed installation into a partition wall, use the recommended framing as shown in Figure 3.

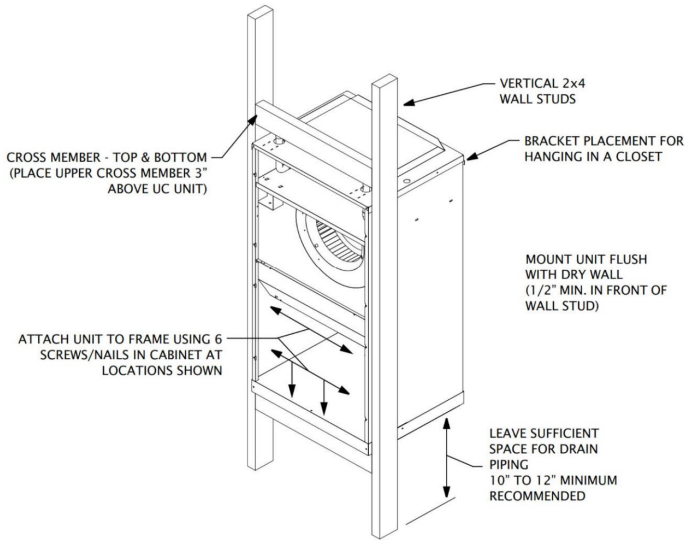


Figure 3 - UC-Hydronic Heat Recessed Wall Mounting (Support Framing)

NOTE

The front face of the unit must be installed flush with the drywall.

This installation requires the optional louvered wall panel, which must be ordered separately. The wall panel and frame are secured to the studs using screws or nails after drywall installation. Refer to Figures 4 and 5 for guidance.

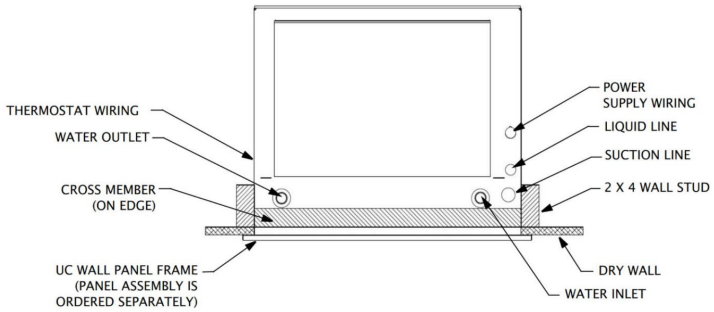


Figure 4 - Installed Unit Top View

CLOSET PLATFORM FRONT RETURN

The fan coil may be installed on a platform and secured using screws or nails. Ensure adequate space beneath the platform for drain piping.

Additionally, provide sufficient clearance at the front of the fan coil to allow access to electrical controls and to remove the motor/blower assembly for servicing. This clearance should be approximately equal to the depth of the fan coil unit.

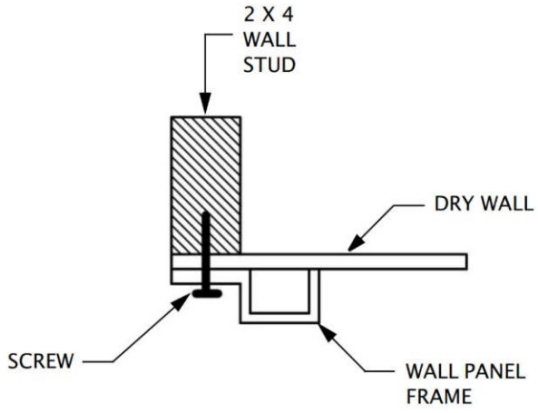


Figure 5 - Detail Of Wall Panel Frame Installation

INSTALLATION CONTINUED

AIR DISTRIBUTION DUCTS

All ductwork must be installed in accordance with NFPA 90A and 90B requirements. Ducts must be properly insulated to prevent condensation during cooling operation and to reduce heat loss during heating operation. All return air must be filtered to prevent dirt accumulation on the coil surface.

If a non-ducted return is used, local installation codes may restrict the unit to single-story residential applications. In many installations, ductwork sized to match the fan coil connections is acceptable; however, unique layouts or long duct runs must be evaluated by a qualified professional. The manufacturer is not responsible for equipment that is improperly applied.

The supply and return duct system must be sized to meet the unit's airflow requirements and external static pressure capability. Ductwork should be insulated with a minimum of 1 inch of insulation with a vapor barrier when installed in conditioned spaces, or a minimum of 2 inches when installed in unconditioned spaces.

UCS* DUCT FLANGE INSTRUCTIONS

UCS* air handler units are shipped with flat top panels. In field applications, the duct flanges must be manually formed by bending them upward to a 90-degree angle to accommodate duct connections. Refer to Figure 6-7 – Duct Flange Instructions for proper bending procedure.

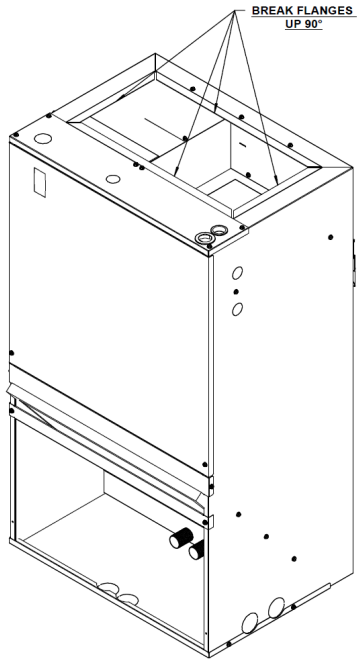


Figure 6 - Duct Flange Instructions

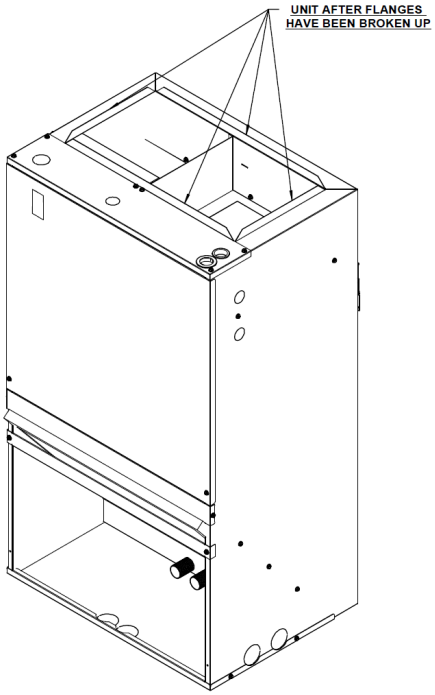


Figure 7 - Duct Flange Instructions

HOT WATER COIL PIPING PRECAUTIONS

1. Flush all field piping prior to connection to remove debris.
2. Use wet cotton rags to cool valve bodies when soldering.
3. Open all valves prior to soldering (mid-way for hand valves, manually for motorized valves).
4. When soldering to bronze or brass, heat the piping within the socket/cup and introduce solder only when the flux boils rapidly. Avoid directing flame into the solder joint.
5. Apply heat to the valve cup for minimal time only, even when using wet rags, to prevent damage.
6. Avoid rapid quenching of solder joints, as this can produce inferior-quality joints.
7. Allow for expansion and contraction of piping systems. All horizontal and vertical risers, including runouts, must accommodate temperature-induced movement to prevent damage or failure of piping, fittings, and valves.
8. Install field piping with consideration for additional space required for electrical routing.
9. Connect all piping in accordance with accepted industry standards and comply with all applicable regulations.
10. Refer to Flow Control Module installation instructions for proper pump installation, if used.

INSTALLATION CONTINUED

Connection Details:

- Hot water coil connections are 3/4" [19.05 mm] nominal (7/8” [22.23 mm] OD) copper.
- Hot water supply should connect to the right side of the fan coil when facing the unit upright from the front.

WARNING

An expansion tank may be required if a back-flow preventer is installed in the system.

UCS*-Hydronic Heat

All piping between the water heater and fan coil unit should be 3/4” [19.05 mm] nominal (7/8” [22.23 mm] OD) copper pipe to prevent excessive head pressure loss. If copper or other piping material is used the installer must calculate its pressures drop and size pipe and overall length accordingly to match the performance of the circulator. Maximum GPM through the coil is 4.5 GPM.

It is also recommended that all piping be adequately insulated to prevent freezing when piping is run in an unconditioned space.

Solder Connections - All copper joints in the water lines must be made with low temperature - non lead solder.

"T" Connections (at the water heater)-

Water lines to and from the fan coil unit must be taken from the horizontal connection of the "T" fittings in the vertical hot and cold-water supply lines at the water heater. This ensures that any air in the system will be purged each time water is used in the dwelling. See Figure 5.

Isolation Valves - Two valves are recommended to be installed within the circulating loop to permit servicing of the system if required and to assist in purging the system.

NOTE

Freeze protection is available for applications where the fan coil is located in ambient air spaces (e.g., attics, crawl spaces) or within structures that may be unoccupied during freezing conditions. Consult the factory for detailed recommendations and availability.

NOTE

Hot water can cause serious scalding hazards. Water temperatures typically required for space heating (135–140 °F [57–60 °C]) may exceed limits allowed by certain codes for domestic hot water.

An anti-scald mixing valve can be installed in the hot water piping to temper domestic water to a safe temperature while maintaining higher temperatures for space heating.

These valves are available locally and must be installed in accordance with the manufacturer’s instructions.

CAUTION

Hydronic systems are not designed for air pressure testing and should be tested only with water. Using air to pressurize the system may cause equipment damage.

When all connections are complete, pressure test system. Repair any solder joint leaks and gently tighten any leaking valve packing nuts and piping accessories, as required.

CAUTION

Do not bend or reposition coil header tubing when connecting piping for alignment purposes. Improper handling may fracture the tubing, potentially resulting in water leaks under system pressure.

COOLING COIL PIPING

These fan coil units are supplied with a direct expansion refrigerant coil. The suction and liquid lines must be sized in accordance with the outdoor unit manufacturer's recommendations.

INSTALLATION CONTINUED

Condensate drain lines must be installed with sufficient slope away from the unit to ensure positive drainage. Because the drain pan is located on the suction side of the blower, a negative pressure condition exists at the pan; a minimum trap of 1-1/2" [38.10 mm] should be provided in the drain line to ensure proper drainage. Even in locations where the return-air plenum is large enough that negative pressure is unlikely, a trapped condensate line is recommended to guarantee proper drainage under any condition.

WARNING

The drain connections on plastic drain pans must be hand-tightened only.

AUXILIARY CONDENSATE SWITCH

An auxiliary condensate switch may be installed in place of an auxiliary drain line, where permitted by local codes.

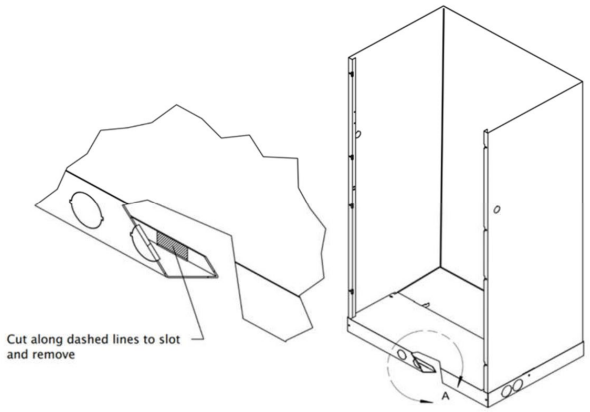


Figure 8 - Front Drain Applications

For front drain applications cut as shown and remove metal tab to allow drain piping to slope away front the drain pan properly. Ensure that the drain piping has proper slope and is able to drain.

WARNING

If the secondary drain is not installed, it must be properly plugged to prevent water leakage, which could cause structural damage or equipment failure.

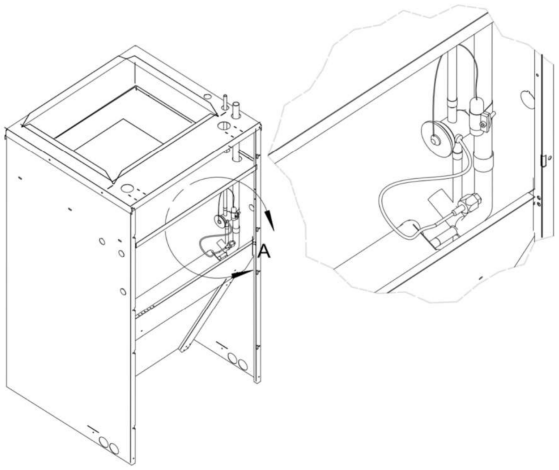


Figure 9 - Thermostatic Expansion Valve Installation

Install expansion valves as shown with directional arrow toward the coil. Attach the TXV bulb to the vertical suction line as shown with the tubing on top. External equalizer is to be attached to the 1/4” [6.35 mm] flare connector. Ensure that a service valve core is not installed before attaching the equalizer line. Wrap the bulb with insulation tape to completely seal the bulb from ambient air.

WARNING

When soldering or brazing, keep a fire extinguisher readily available at all times. When working near valves or other sensitive components, use heat shields or wet rags to protect these parts from heat exposure. Failure to protect components during soldering or brazing can result in damage to valves and other critical parts, leading to equipment malfunction or unsafe operating conditions.

INSTALLATION CONTINUED

WARNING

Always wear eye protection.

Fan coil components rotate at high speeds during operation; do not touch moving parts with any object to avoid personal injury.

Ensure all electrical and service access panels are properly installed and secured.

Remove all tools, equipment, and debris from the surrounding area.

Inspect the unit to confirm it is clean and free of foreign material.

These fan coil units are equipped with a direct-expansion refrigerant coil. Suction and liquid refrigerant lines must be sized according to the outdoor unit manufacturer's specifications.

CAUTION

Do not bend or reposition the coil header tubing when connecting piping to the fan coil unit. Doing so may cause tubing fractures and result in refrigerant leaks under system pressure.

WARNING

The drain connections on plastic drain pans must be hand-tightened only.

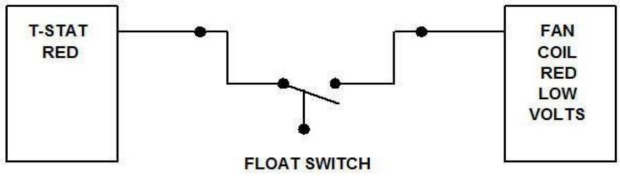


Figure 10 - Float Switch

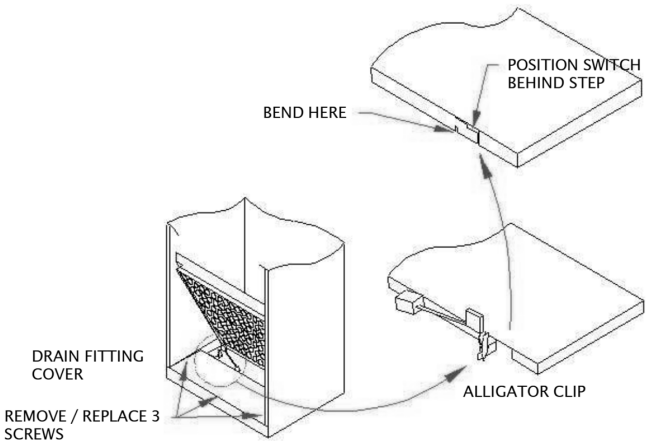


Figure 11 - Auxiliary Float Switch Installation

Five available programmed speed taps, 24 VAC. Refer to the unit wiring diagrams for proper connections.

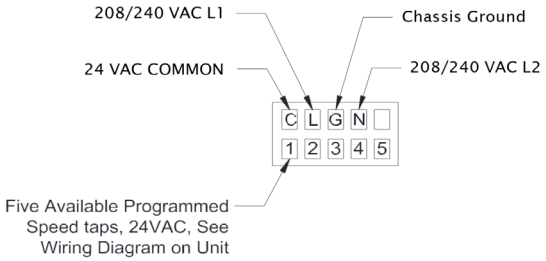


Figure 12 - Brushless DC Motor Connections

PHYSICAL DIMENSIONS

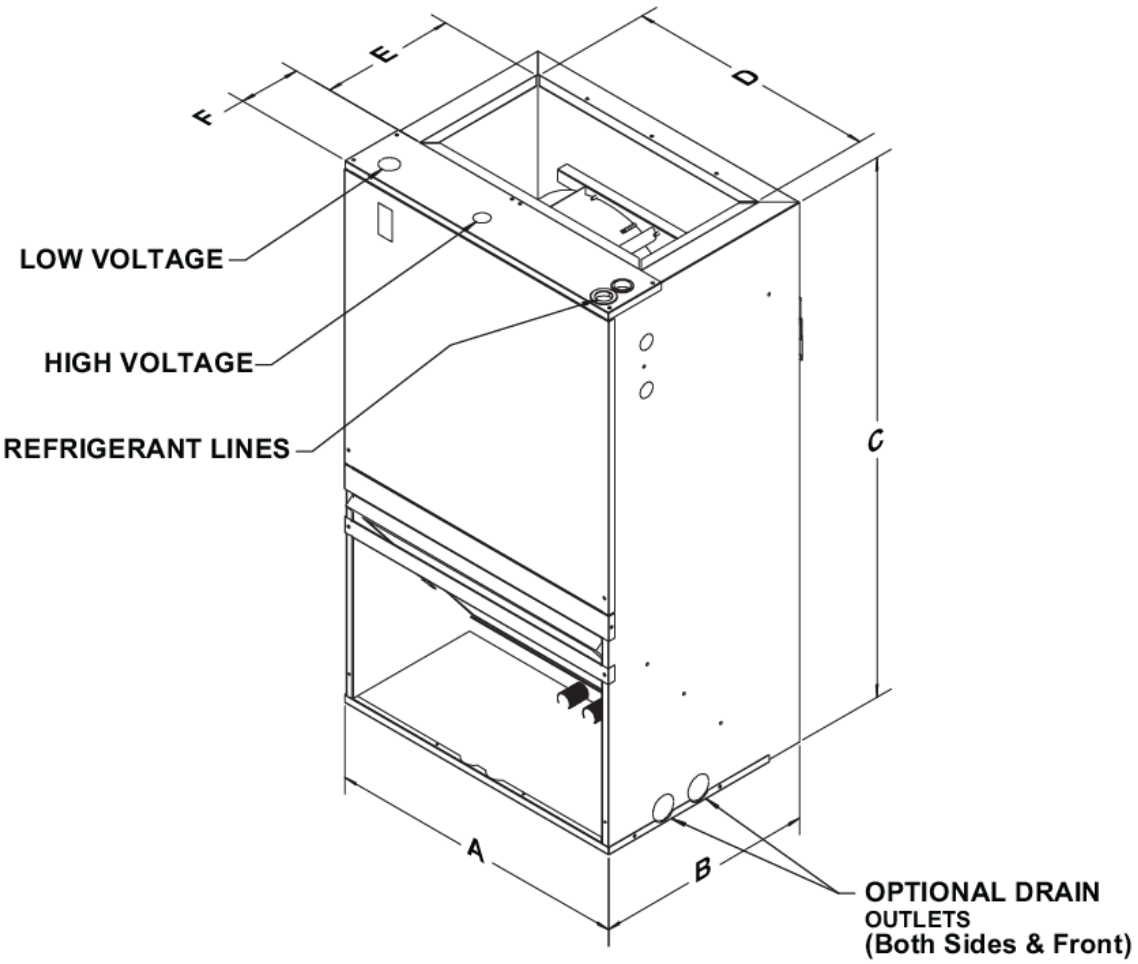


Figure 13 - Physical Dimensions UCS* EH

Physical Dimensions – UCS* Series (in) [cm]									
MODEL	A	B	C	D	E	F	FILTER SIZE	LIQUID LINE	SUCTION LINE
18-25 UCS*	20-5/8" [52.39]	15-1/16" [38.26]	36-1/2" [92.71]	17-1/3" [44.03]	9-1/3" [23.71]	4-11/64" [10.60]	16 X 20 [40.64 X 50.8]	3/8 O.D [9.5mm]	3/4 O.D [19mm]
26,31 UCS*	20-5/8" [52.39]	17-1/16" [43.34]	36-1/2" [92.71]	17-1/3" [44.03]	9-1/3" [23.71]	6-1/8" [10.60]	16 X 20 [40.64 X 50.8]	3/8 O.D [9.5mm]	3/4 O.D [19mm]
30,32,36,37 UCS*	22-3/16" [56.36]	19-3/32" [48.50]	39-11/16" [99.06]	18-13/16" [47.78]	8-15/16" [22.70]	8-9/16" [21.75]	20 X 20 [50.8 X 50.8]	3/8 O.D [9.5mm]	3/4 O.D [19mm]

TABLE 5

PHYSICAL DIMENSIONS CONTINUED

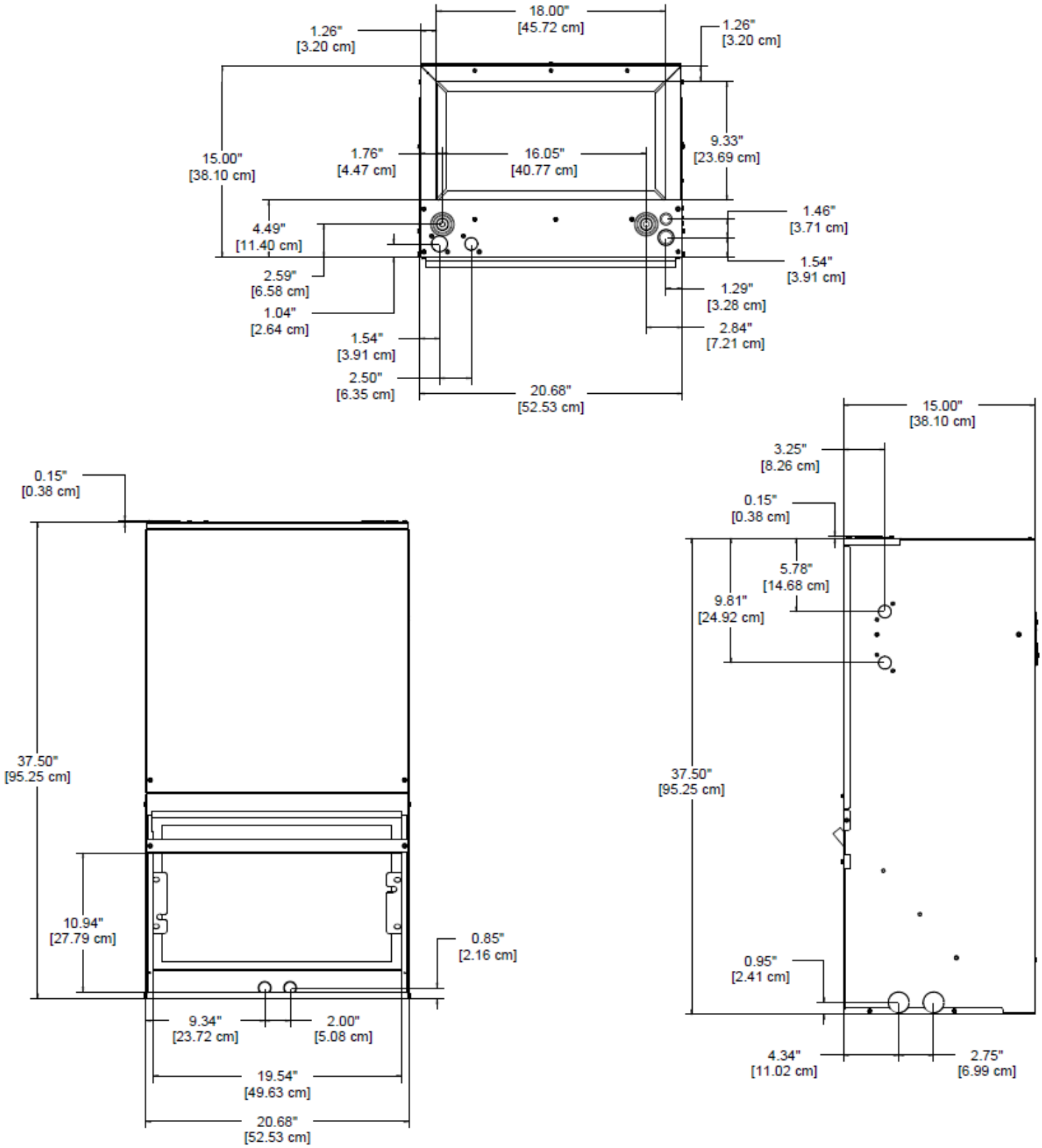


Figure 14 - Physical Dimensions UCS* Hydronic Heat 18/19/25

PHYSICAL DIMENSIONS CONTINUED

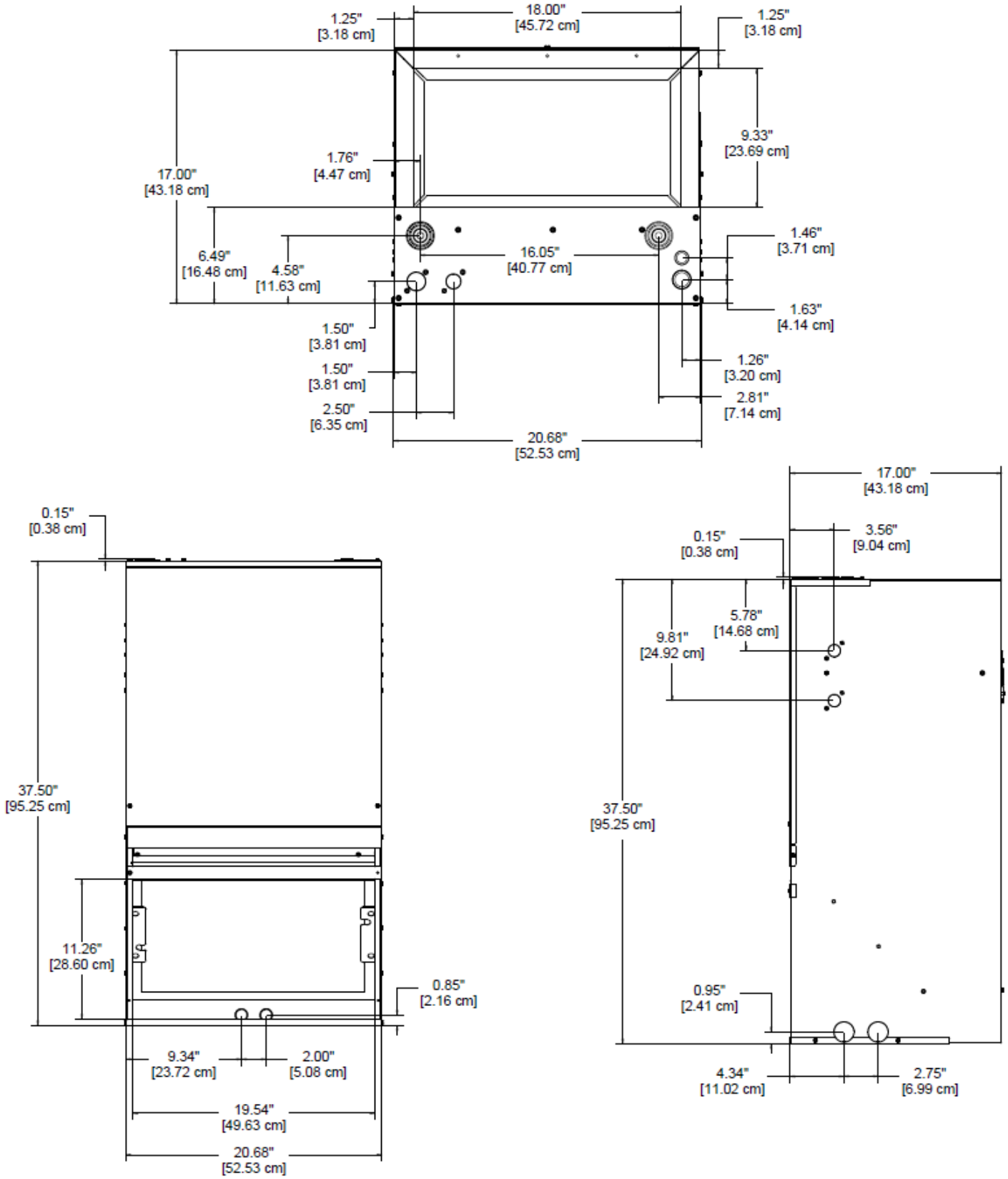


Figure 15 - Physical Dimensions UCS* Hydronic Heat 26/31

PHYSICAL DIMENSIONS CONTINUED

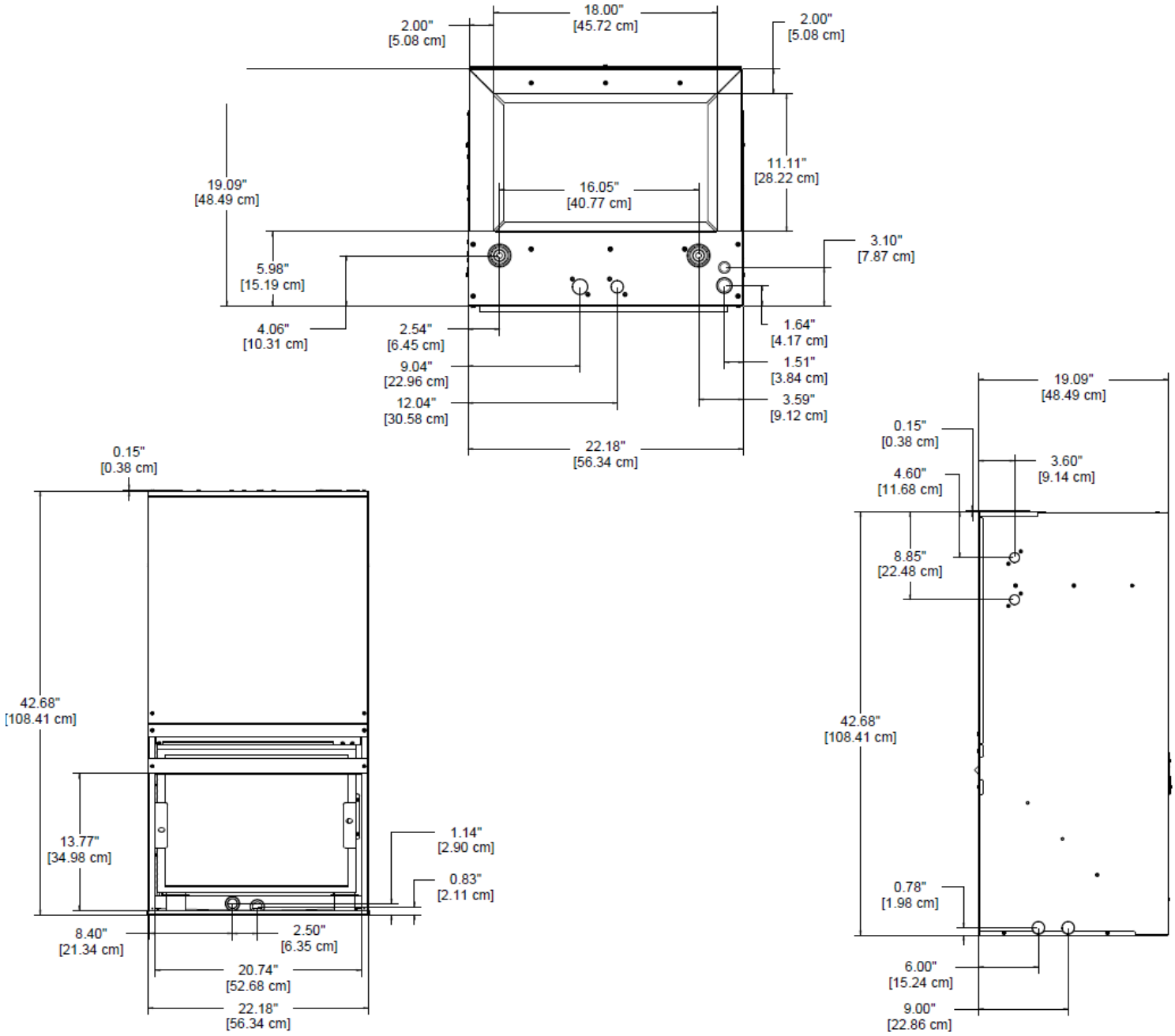


Figure 16 - Physical Dimensions UCS* Hydronic Heat 30/31/36/37

ELECTRICAL

WARNING

ELECTRIC SHOCK HAZARD

Disconnect all power sources before servicing and implement lockout/tagout procedures to prevent accidental electrical shock.

Note: Multiple power sources may be present.

- Use copper conductors only for all field wiring.
- Ensure all parts and access panels are properly installed before operating the unit.
- Failure to follow these warnings can result in serious injury or death.

All wiring must comply with local and national electrical codes.

Units include wiring diagrams and nameplate data to guide proper field wiring. Refer to Figure 2 for wiring entry points into the cabinet.

These units are equipped with a Class 2 transformer for 24-volt control circuits. If additional equipment includes a Class 2 transformer, ensure outputs are not interconnected. Use a thermostat with isolating contacts to prevent electrical conflicts.

Heater kits are approved only for installation in models designated as “0 kW.” Field-installed heater kits must not be used in units manufactured with factory-installed electric heat.

All field-installed wiring supplying power to the unit and/or electric heaters must include a properly rated disconnect device located within sight of the unit.

WARNING

Units with ECM motors have line voltage present at all times. Disconnect power before servicing to prevent electrical shock or injury.

WARNING

ELECTRIC SHOCK HAZARD

Transformers are multi-voltage. Always consult the unit wiring diagram, the transformer wiring diagram, and the unit’s rated voltage to ensure correct connections and safe operation.

WARNING

The unit cabinet must have an uninterrupted, continuous ground to reduce the risk of personal injury in the event of an electrical fault. Provide a ground circuit in accordance with all applicable national and local codes.

Electrical installation must comply with the National Electrical Code (NEC) in the U.S. and any additional local or regional codes.

In Canada, electrical work must comply with CSA C22.1 standards.

Determine the correct wire size by referring to the latest edition of the National Electrical Code (NEC) in the U.S., or the Canadian Electrical Code (CEC) in Canada.

NOTE

Electric heat can be factory- or field-installed.

WARNING

ELECTRIC SHOCK HAZARD

A means of disconnection must be provided in the fixed wiring in accordance with applicable wiring codes.

UCS* ELECTRIC HEAT PERFORMANCE DATA

UCS* with Electric Heat, PSC Blower													
UNIT MODEL	NOM. CFM	CAPACITY (BTUH)	ELECTRIC HEAT OPTION	ELECTRIC HEAT CAPACITY				TOTAL AMPS		MIN. CIRCUIT AMPACITY		MAX. OVERCURRENT PROTECTION	
				kW		BTUH							
				240V	208V	240V	208V	240V	208V	240V	208V	240V	208V
18 19 20	600	18,000	0	0.0	0.0	0	0	1.7	1.70	2	2	15	15
			3	3.0	2.3	10,239	7,781	14.0	12.76	18	16	20	20
			5	5.0	3.8	17,065	12,969	22.0	18.0	27	25	30	30
			8	8.0	6.0	27,304	20,750	34.0	29.0	43	37	45	40
			10	10.0	7.5	34,130	25,597	43.0	37.76	54	47	60	50
24 25 26	800	24,000	0	0.0	0.0	0	0	2.0	2.0	3	3	15	15
			3	3.0	2.3	10,239	7,781	15.0	15.0	18	16	20	20
			5	5.0	3.8	17,065	12,969	23.0	19.97	28	26	30	30
			8	8.0	6.0	27,304	20,750	35.0	30.55	44	38	45	40
			10	10.0	7.5	34,130	25,597	43.0	37.76	54	47	60	50
30 31 32	1,000	30,000	0	0.0	0.0	0	0	2.0	2.0	3	3	15	15
			3	3.0	2.3	10,239	7,781	15.0	15.0	18	16	20	20
			5	5.0	3.8	17,065	12,969	23.0	19.97	28	26	30	30
			8	8.0	6.0	27,304	20,750	35.0	30.55	44	38	45	40
			10	10.0	7.5	34,130	25,597	44.0	38.0	55	48	60	50
36 37	1,200	36,000	0	0.0	0.0	0	0	2.50	2.50	4	4	15	15
			3	3.0	2.3	10,239	7,781	1.60	15.70	19	17	20	20
			5	5.0	3.8	17,065	12,969	23.0	20.0	29	26	30	30
			8	8.0	6.0	27,304	20,750	35.0	31.0	44	39	45	40
			10	10.0	7.5	34,130	25,597	44.0	38.0	55	48	60	50

Table 3

UCS* ELECTRIC HEAT PERFORMANCE DATA CONTINUED

UCS* with Electric Heat, ECM Blower												
UNIT MODEL	NOM. CFM	CAPACITY (BTUH)	ELECTRIC HEAT OPTION	ELECTRIC HEAT CAPACITY				TOTAL AMPS		MIN. AMPACITY		MAX. OVERCURRENT PROTECTION	
				kW		BTUH							
				240V	208V	240V	208V	240V	208V	240V	208V	240V	208V
18 19 20	600	18,000	0	0.0	0.0	0	0	2.80	2.80	4	4	15	15
			3	3.0	2.30	10,236	6,824	15.30	13.60	20	18	20	20
			5	5.0	3.80	17,061	13,648	23.60	20.80	30	27	30	30
			8	8.0	6.0	27,297	20,473	36.10	31.60	46	40	50	40
			10	10.0	7.50	34,121	25,591	44.50	38.90	56	49	60	50
24 25 26	800	24,000	0	0.0	0.0	0	0	2.80	2.80	4	4	15	15
			3	3.0	2.30	10,236	6,824	15.30	13.60	20	18	20	20
			5	5.0	3.80	17,061	13,648	23.60	20.80	30	27	30	30
			8	8.0	6.0	27,297	20,473	36.10	31.60	46	40	50	40
			10	10.0	7.50	34,121	25,591	45.80	40.20	58	50	60	50
30 31 32	1,000	30,000	0	0.0	0.0	0	0	4.10	4.10	6	6	15	15
			3	3.0	2.30	10,236	6,824	16.60	14.90	21	19	25	20
			5	5.0	3.80	17,061	13,648	24.90	22.10	32	28	35	30
			8	8.0	6.0	27,297	20,473	37.40	32.90	47	42	50	45
			10	10.0	7.50	34,121	25,591	47.70	42.10	60	53	60	60
36 37	1,200	36,000	0	0.0	0.0	0	0	4.10	4.10	6	6	15	15
			3	3.0	2.30	10,236	6,824	16.60	14.90	21	19	25	20
			5	5.0	3.80	17,061	13,648	24.90	22.10	32	28	35	30
			8	8.0	6.0	27,297	20,473	37.40	32.90	47	42	50	45
			10	10.0	7.50	34,121	25,591	45.80	40.20	58	50	60	50

Table 4

UCS* HYDRONIC HEAT PERFORMANCE DATA

UCSW* 4Row Performance Data										
UNIT MODEL	NOM. COOLING (BTUH)	P.D. FT. WTR. COIL ONLY	HEATING CAPACITY BTUH (1000) AT ENTERING WATER TEMPERATURE (1) DELTA-T 20°						MCA	MOCP
			120°F	GPM	140°F	GPM	180°F	GPM		
18 19 20	18,000	3.2	18.3	2.5	25.7	2.5	40.4	2.5	8	15
		2.1	17.7	3.5	24.8	3.5	39.0	3.5		
		1.1	16.9	4.5	23.9	4.5	37.1	4.5		
24 25 26	24,000	3.2	22.0	2.5	30.8	2.5	48.3	2.5	9	15
		2.1	21.2	3.5	29.7	3.5	46.7	3.5		
		1.1	19.9	4.5	28.0	4.5	44.0	4.5		
30 31 32	30,000	3.2	28.0	2.5	39.2	2.5	61.5	2.5	11	15
		2.1	25.8	3.5	36.1	3.5	56.8	3.5		
		1.1	25.1	4.5	35.2	4.5	55.2	4.5		
36 37	36,000	3.7	31.2	2.5	43.6	2.5	68.0	2.5	11	15
		2.5	29.8	3.5	41.5	3.5	65.3	3.5		
		1.3	27.4	4.5	38.4	4.5	60.5	4.5		

Table 5

NOTES:

1. Size 31 not available with PSC motor.

UCSQ* 4Row Performance Data										
UNIT MODEL	NOM. CAPACITY (BTU/h))	HEATING CAPACITY (BTUH)				TOTAL AMPS (PUMP 120V)	CAST IRON PUMP MED. FLOW (A)	BRONZE PUMP LOW FLOW (A)	MCA	MOCP
		120°F	GPM	140°F	GPM					
18 19 20	18,000	17,800	3.5	24,600	3.5	4.1	0.75	0.54	8	15
24 25 26	24,000	21,200	3.5	29,800	3.5	6.5	0.75	0.54	11	15
30 31 32	30,000	26,000	3.5	36,400	3.5	6.5	0.75	0.54	12	15
36 37	36,000	29,600	3.5	41,500	3.5	6.5	0.75	0.54	12	15

Table 6

NOTES:

1. Size 31 not available with PSC motor.

UCS* HYDRONIC HEAT PERFORMANCE DATA CONTINUED

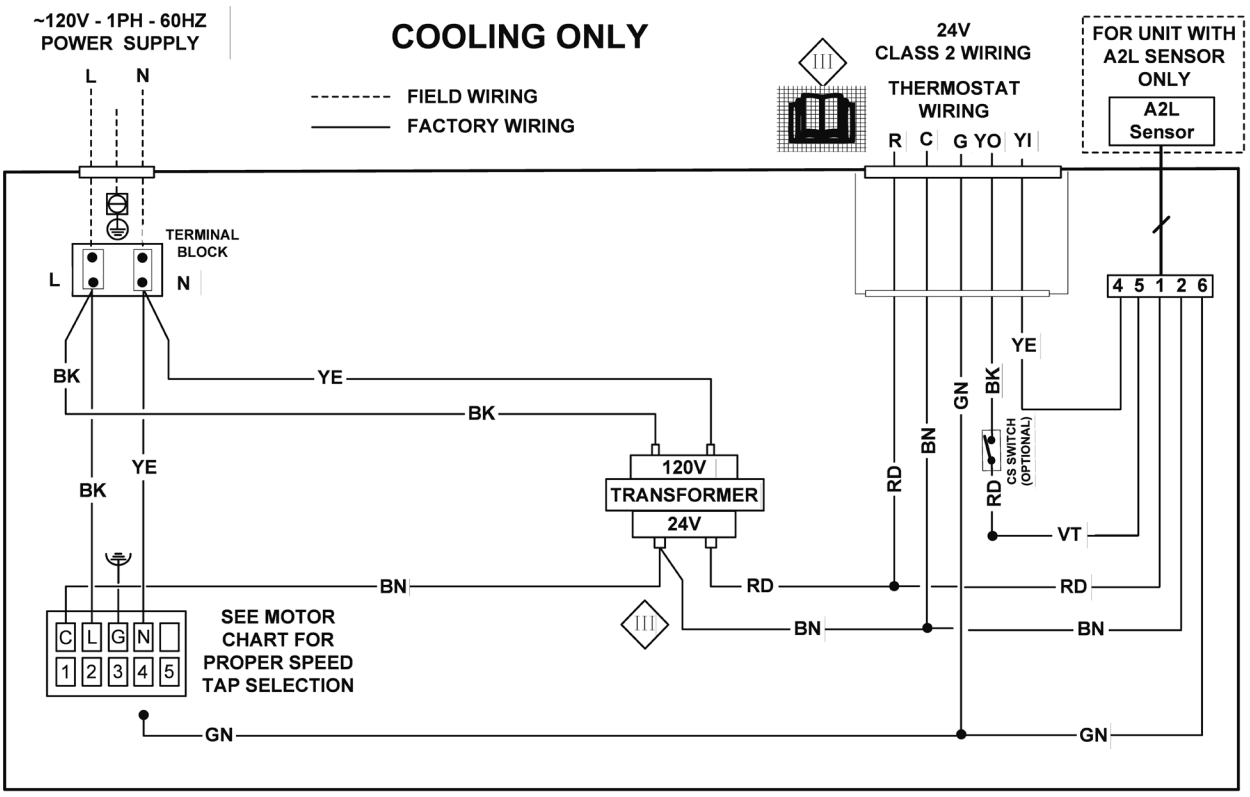
UCSR* 4Row Performance Data										
UNIT MODEL	NOM. CAPACITY (BTU/h))	NOM (CFM)	HTG GPM (NOM)	HEATING CAPACITY (BTHU)			TOTAL AMPS (PUMP 120V)	TOTAL AMPS (MOTOR 120V)	MCA	MOCP
				120°F	140°F	160°F				
18 19 20	18,000	600	4	14,900	23,900	24,400	4.1	0.84	8	15
24 25 26	24,000	800	4	18,300	25,500	32,800	6.5	0.84	9	15
30 31 32	30,000	1,000	4	19,300	27,100	34,800	6.5	0.84	11	15
36 37	36,000	1,200	4	22,700	31,800	41,000	6.5	0.84	11	15

Table 7

NOTES:

1. Size 31 not available with PSC motor.

WIRING DIAGRAMS



MODEL	NOMINAL COOLING CAPACITY	MOTOR SPEED TAP CONNECTION (G LEAD)
18/19/20 UCS	18,000	5
24/25/26 UCS	24,000	4
	18,000	3
30/32 UCS	30,000	3
	24,000	2
31 UCS	30,000	4
	24,000	3
36/37 UCS	36,000	4
	30,000	3

NOTE: TERMINALS SUITABLE FOR COPPER CONDUCTORS ONLY

REMARQUE: UTILISER DES FILS D'ALIMENTATION EN CUIVRE

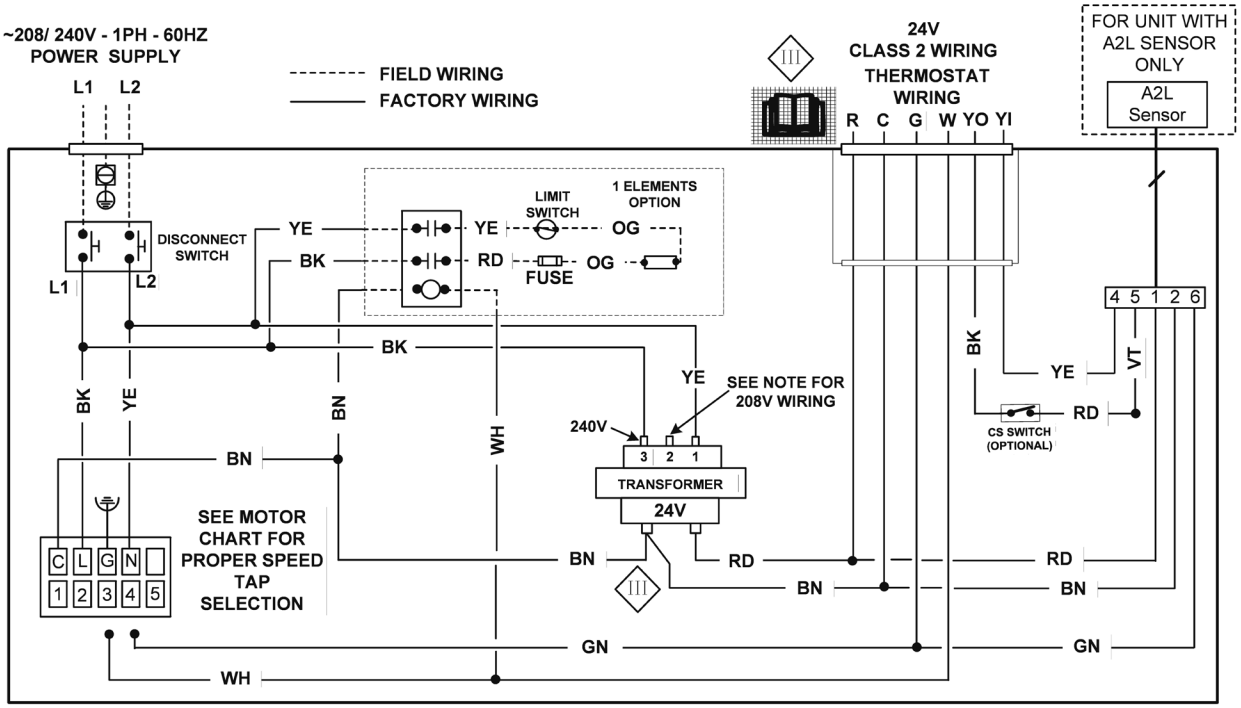
CLASS III CONSTRUCTION

READ THE INSTRUCTIONS

UCS 120
COOLING ECM
WD64X016
Rev A
12/25

Figure 17 – WD64X016, UCS Cool Only ECM, 120V

WIRING DIAGRAMS CONTINUED



NOMINAL COOLING CAPACITY	MODEL	B (COOL) "GN"	A (HEAT) "WH"
18,000	18/19/20 UCS	5	4
24,000	24/25/26 UCS	4	3
18,000		3	2
30,000	30/32 UCS	3	2
24,000		2	1
36,000	36/37 UCS	4	3
30000		3	2
30,000	31 UCS	4	3
24,000		3	2

NOTE: TERMINALS SUITABLE FOR COPPER CONDUCTORS ONLY

REMARQUE: UTILISER DES FILS D'ALIMENTATION EN CUIVRE

FOR 208 VOLT APPLICATION

MOVE BLACK TRANSFORMER LEAD FROM THE END TERMINAL TO THE MIDDLE TERMINAL.

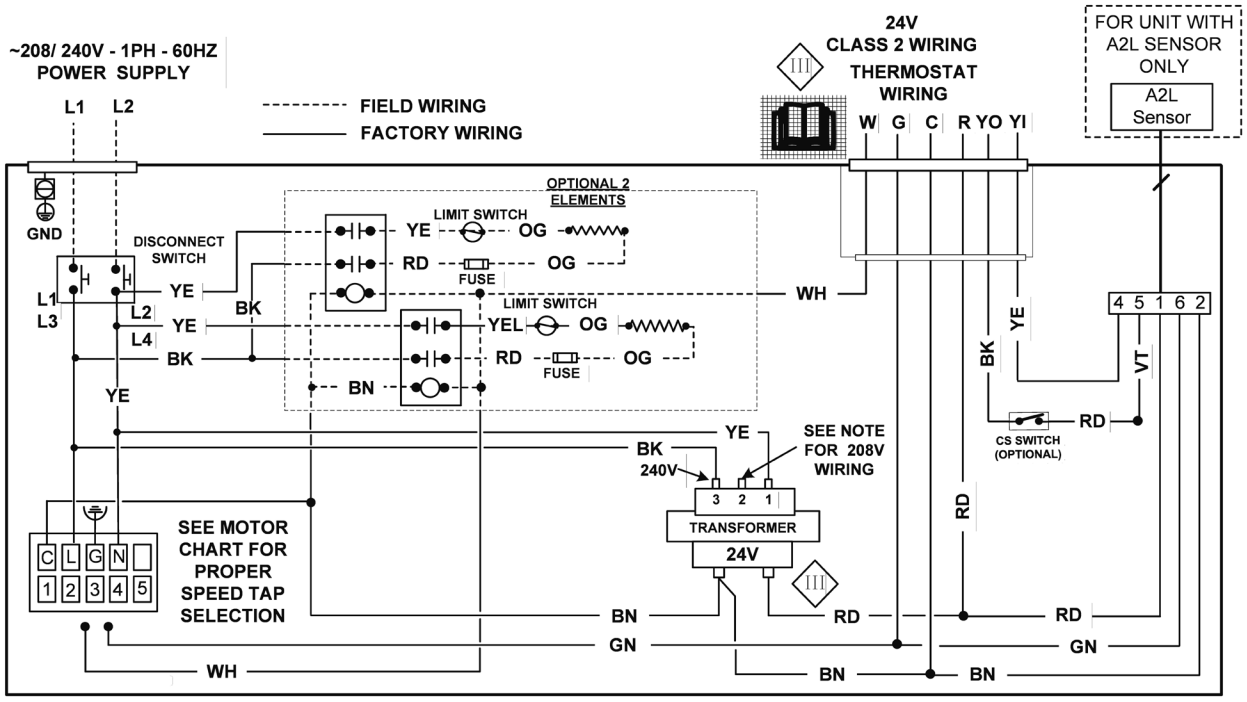
CLASS III CONSTRUCTION

READ THE INSTRUCTIONS

UCS ECM
1 ELEMENT
WD64X017
Rev A
12/25

Figure 18 – WD64X017, UCS-1 Element w/ ECM Motor

WIRING DIAGRAMS CONTINUED



NOMINAL COOLING CAPACITY	MODEL	B (COOL) "GN"	A (HEAT) "WH"
18,000	18/19/20 UCS	5	4
24,000	24/25/26 UCS	4	3
18,000		3	2
30,000	30/32 UCS	3	2
24,000		2	1
36,000	36/37 UCS	4	3
30000		3	2
30,000	31 UCS	4	3
24,000		3	2

FOR 208 VOLT APPLICATION

MOVE BLACK TRANSFORMER LEAD FROM THE END TERMINAL TO THE MIDDLE TERMINAL.

NOTE: TERMINALS SUITABLE FOR COPPER CONDUCTORS ONLY

REMARQUE: UTILISER DES FILS D'ALIMENTATION EN CUIVRE

CLASS III CONSTRUCTION

READ THE INSTRUCTIONS

UCS ECM
2 ELEMENTS

WD64X018
Rev A
12/25

Figure 19 – WD64X018, UCS-HW 2 Elements w/ECM Motor 120V

WIRING DIAGRAMS CONTINUED

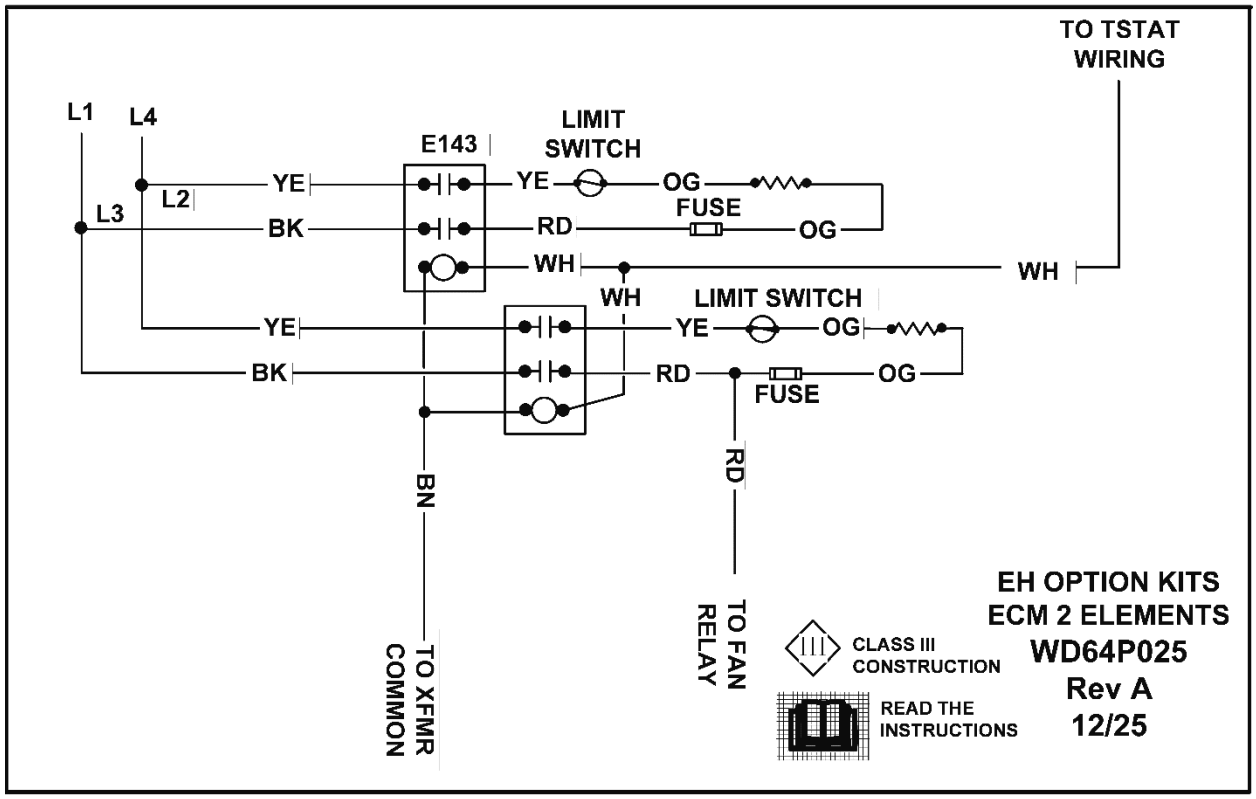
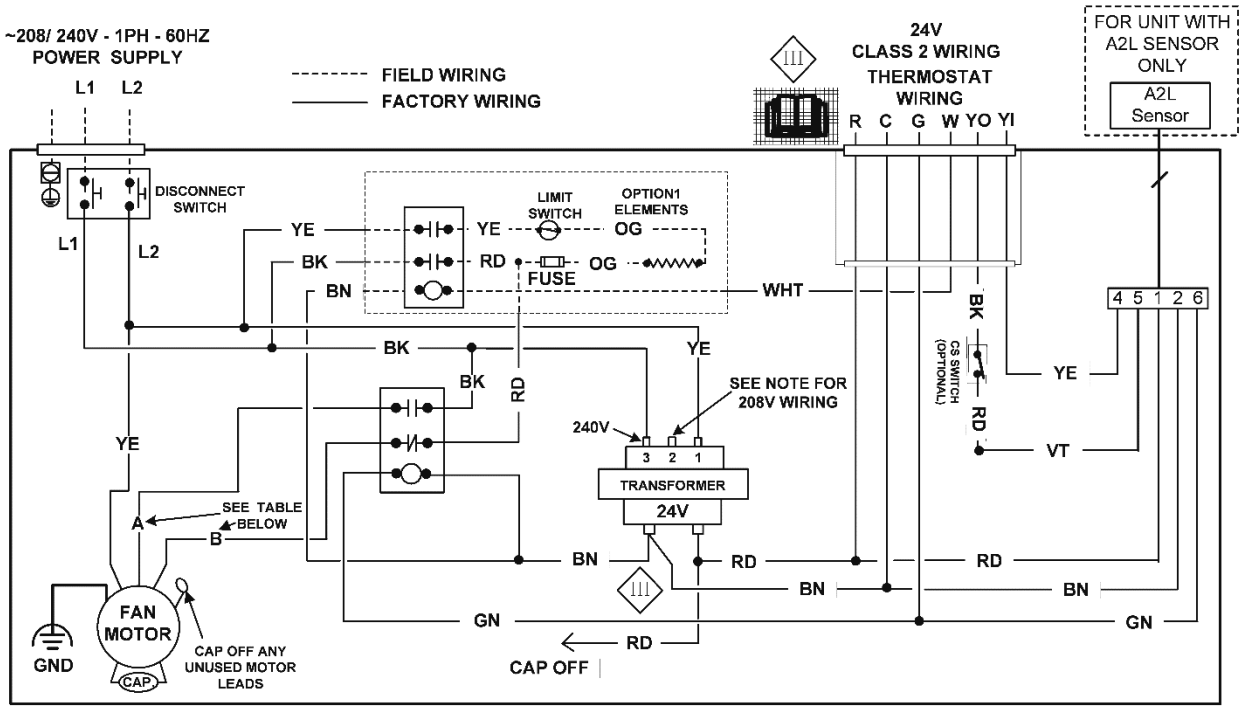


Figure 20 – WD64P025, UCS w/o TDR 2 Element Kits

WIRING DIAGRAMS CONTINUED



NOMINAL COOLING CAPACITY	MODEL	A	B
18,000	18 UCS	BK	BU
	19 UCS	BU	OG
	20 UCS	BK	BU
24,000	24 UCS	OG	RD
	25 UCS	BU	OG
	26 UCS	BU	OG
30,000	30 UCS	BU	OG
	31 UCS	BK	BU
	32 UCS	BK	BU
32,000	36 UCS	OG	RD
	37 UCS	BU	OG

FOR 208 VOLT APPLICATION

MOVE BLACK TRANSFORMER LEAD FROM THE END TERMINAL TO THE MIDDLE TERMINAL.

NOTE: TERMINALS SUITABLE FOR COPPER CONDUCTORS ONLY

REMARQUE: UTILISER DES FILS D'ALIMENTATION EN CUIVRE

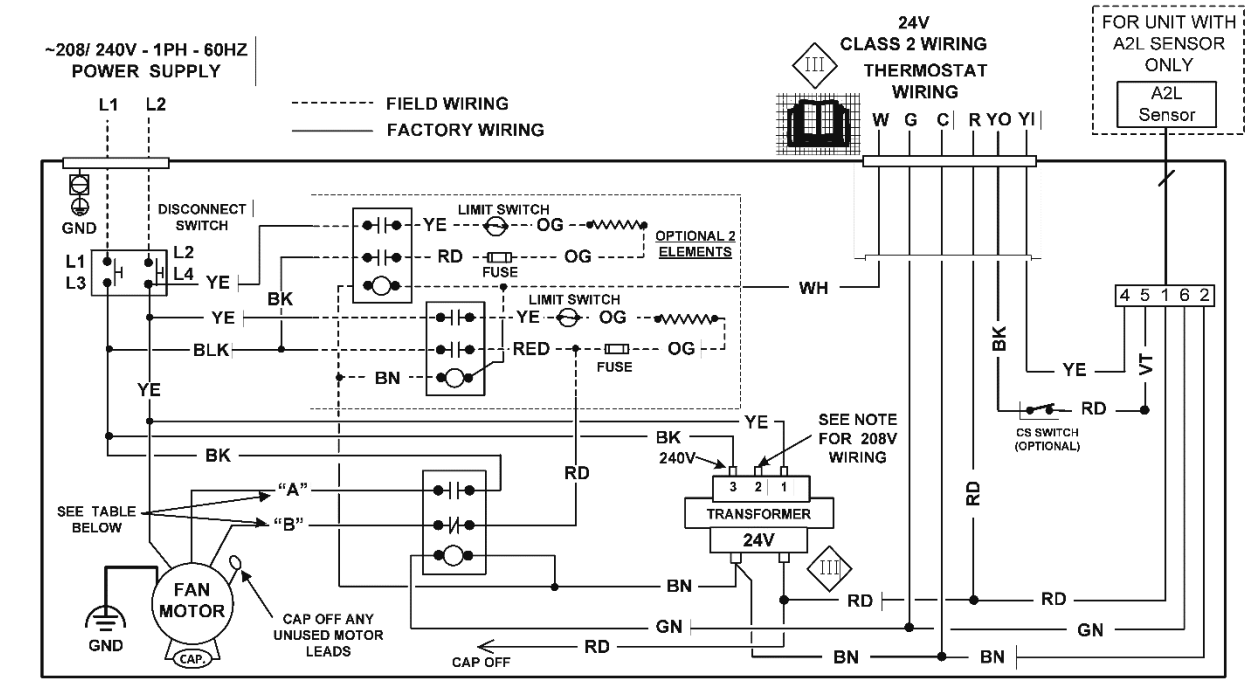
CLASS III CONSTRUCTION

READ THE INSTRUCTIONS

UCS PSC EH KIT
1 ELEMENT W/ RELAY
WD64P026
Rev. A
12/25

Figure 21 – WD64P026, UCS PSC 240V EH Kit 1 Element w/Relay

WIRING DIAGRAMS CONTINUED



NOMINAL COOLING CAPACITY	MODEL	A	B
18,000	18 UCS	BK	BU
	19 UCS	BU	OG
	20 UCS	BK	BU
24,000	24 UCS	OG	RD
	25 UCS	BU	OG
	26 UCS	BU	OG
30,000	30 UCS	BU	OG
	31 UCS	BK	BU
	32 UCS	BK	BU
32,000	36 UCS	OG	RD
	37 UCS	BU	OG

NOTE: TERMINALS SUITABLE FOR COPPER CONDUCTORS ONLY

REMARQUE: UTILISER DES FILS D'ALIMENTATION EN CUIVRE

FOR 208 VOLT APPLICATION

MOVE BLACK TRANSFORMER LEAD FROM THE END TERMINAL TO THE MIDDLE TERMINAL.

NOTE

DO NOT CONNECT THERMOSTAT WIRING TO "W" TERMINAL AT THE THERMOSTAT OR TO WHITE LEAD "W" AT LOW VOLTAGE JUNCTION BOX

CLASS III CONSTRUCTION

READ THE INSTRUCTIONS

UCS PSC EH KIT
2 ELEMENTS W/ RELAY
WD64P027
Rev A
12/25

Figure 22 – WD64P027, UCS PSC 240V EH Kit 2 Element w/Relay

WIRING DIAGRAMS CONTINUED

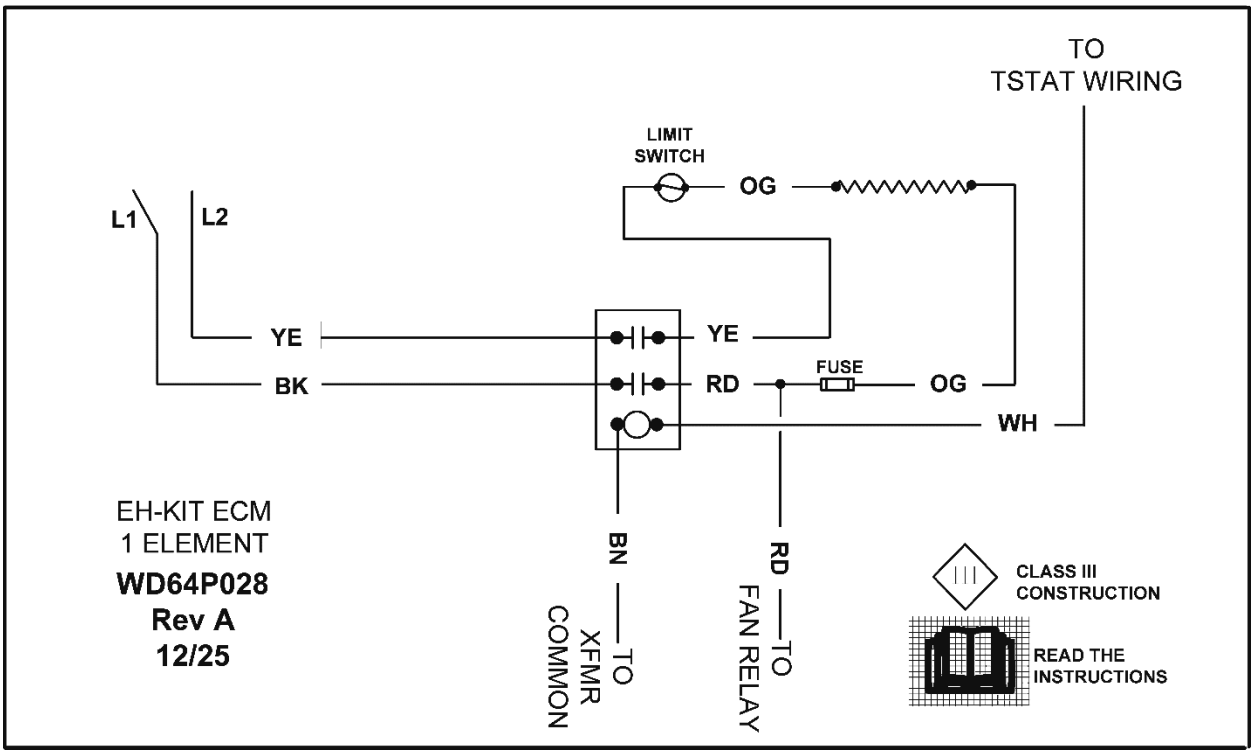
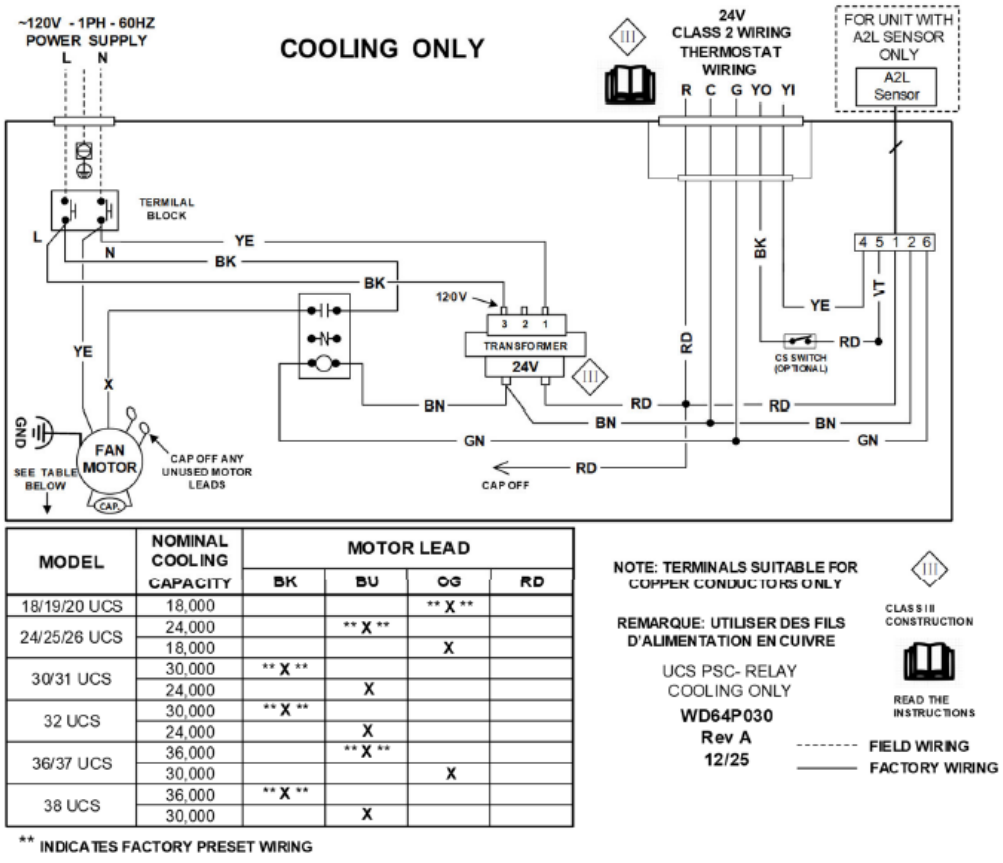


Figure 23 – WD64P028, UCS w/o TDR 240V, 1 Element Kit

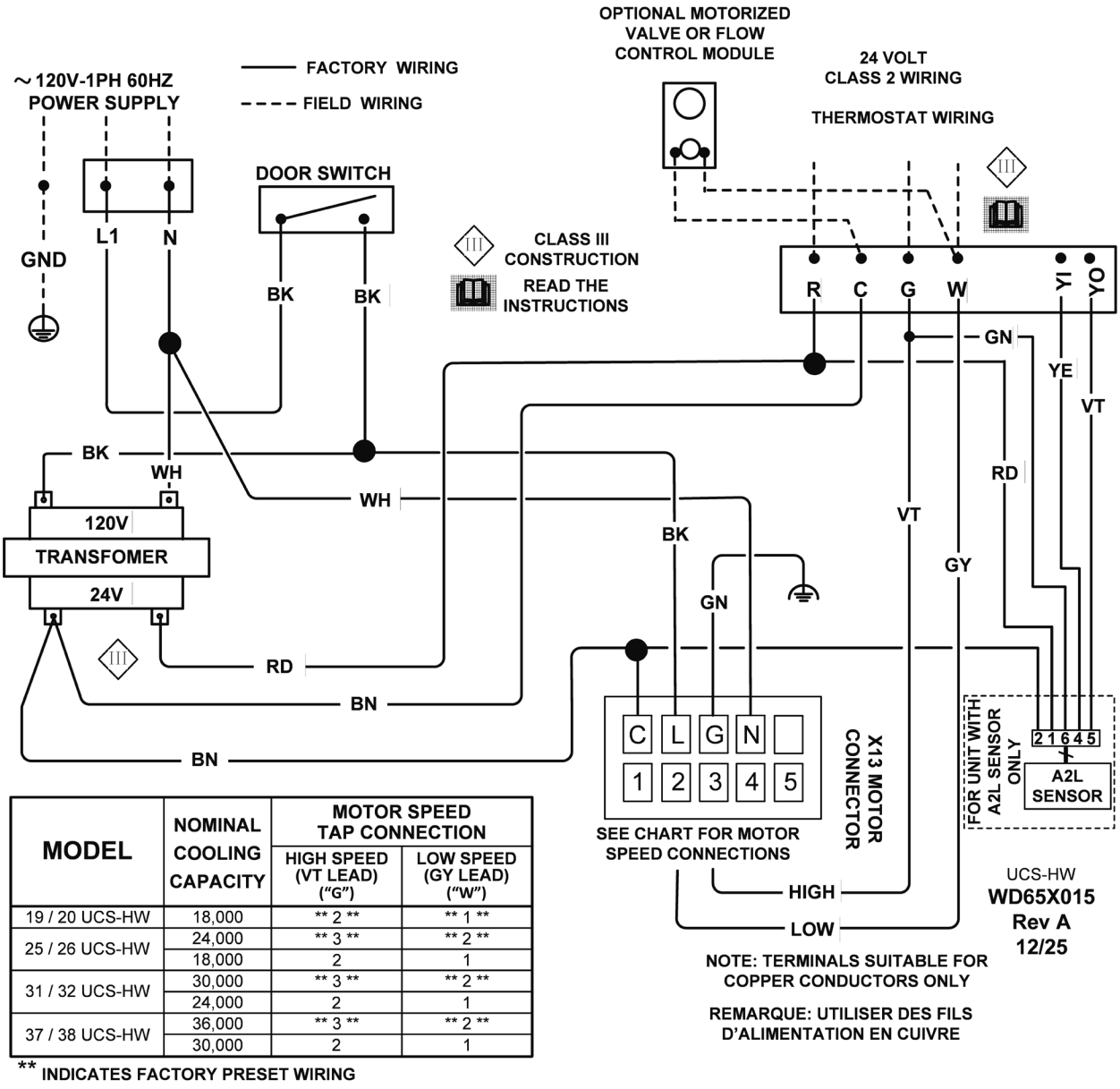


MODEL	NOMINAL COOLING CAPACITY	MOTOR LEAD			
		BK	BU	OG	RD
18/19/20 UCS	18,000			** X **	
24/25/26 UCS	24,000		** X **		
	18,000			X	
30/31 UCS	30,000	** X **			
	24,000		X		
32 UCS	30,000	** X **			
	24,000		X		
36/37 UCS	36,000		** X **		
	30,000			X	
38 UCS	36,000	** X **			
	30,000		X		

** INDICATES FACTORY PRESET WIRING

Figure 24 - WD64P030, UCS PSC, Cool Only w/ Relay 120V

WIRING DIAGRAMS CONTINUED

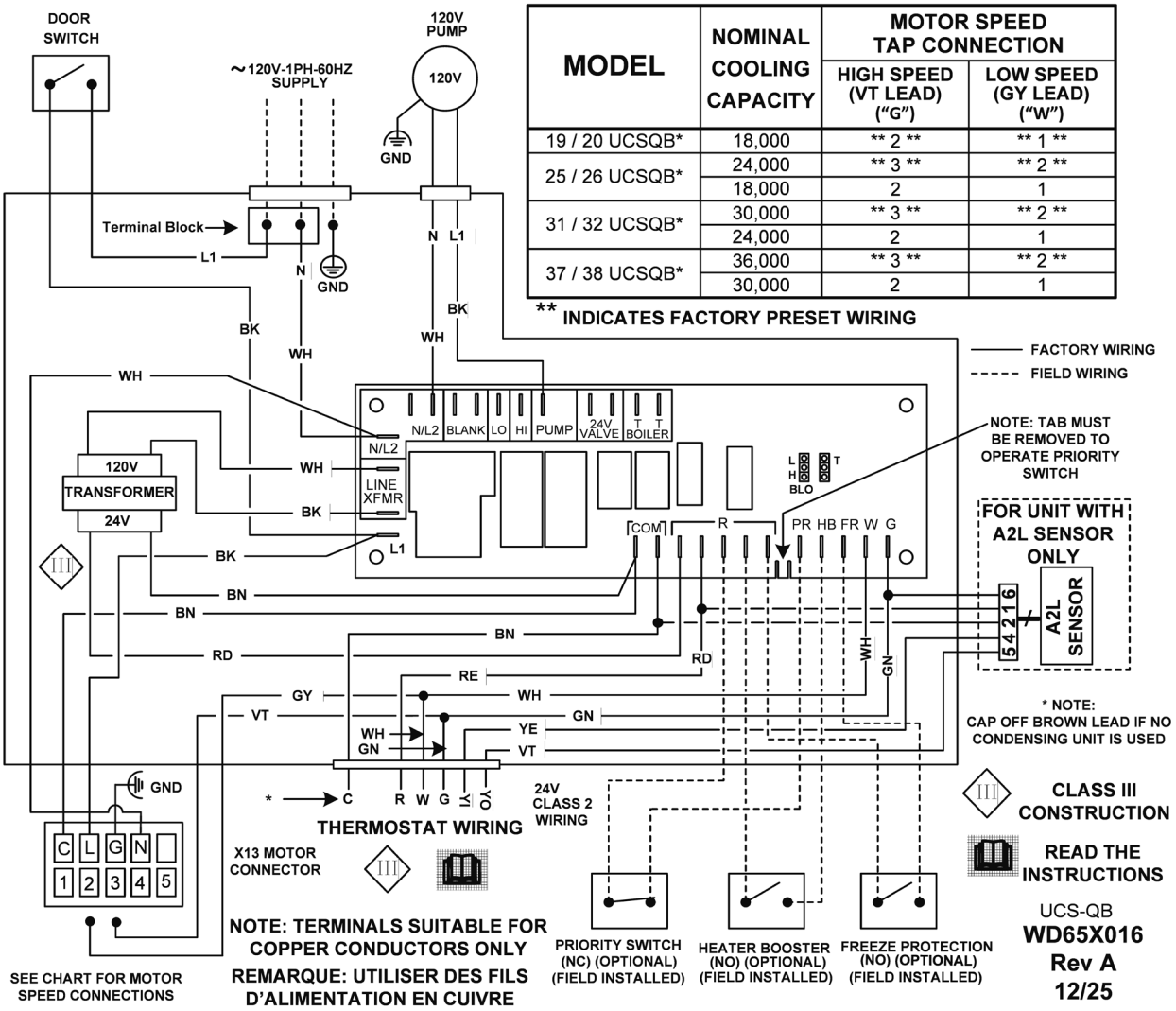


MODEL	NOMINAL COOLING CAPACITY	MOTOR SPEED TAP CONNECTION	
		HIGH SPEED (VT LEAD) ("G")	LOW SPEED (GY LEAD) ("W")
19 / 20 UCS-HW	18,000	** 2 **	** 1 **
25 / 26 UCS-HW	24,000	** 3 **	** 2 **
	18,000	2	1
31 / 32 UCS-HW	30,000	** 3 **	** 2 **
	24,000	2	1
37 / 38 UCS-HW	36,000	** 3 **	** 2 **
	30,000	2	1

** INDICATES FACTORY PRESET WIRING

Figure 25 - WD65X015, UCS-HW w/ECM Motor 120V

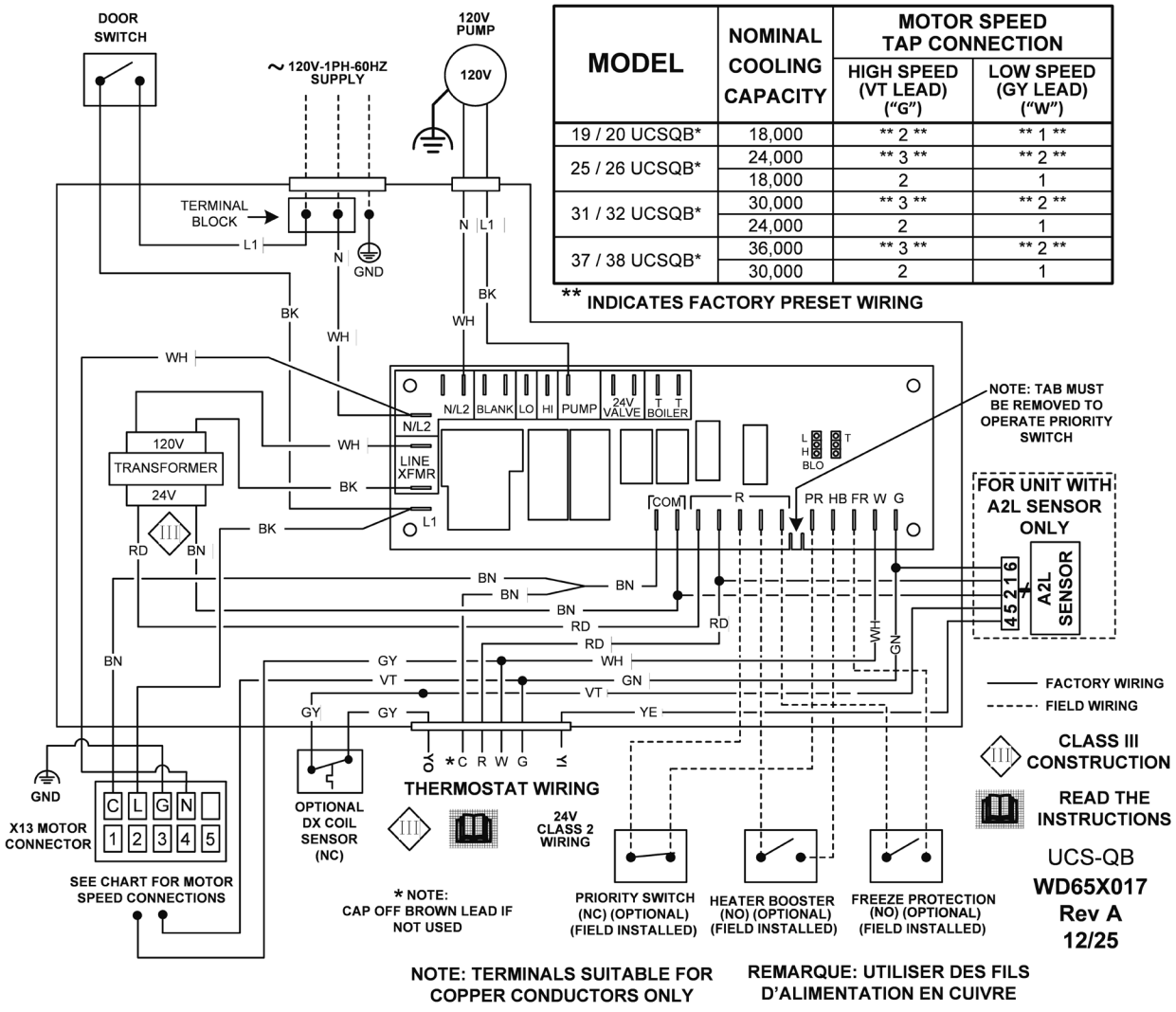
WIRING DIAGRAMS CONTINUED



MODEL	NOMINAL COOLING CAPACITY	MOTOR SPEED TAP CONNECTION	
		HIGH SPEED (VT LEAD) ("G")	LOW SPEED (GY LEAD) ("W")
19 / 20 UCSQB*	18,000	** 2 **	** 1 **
25 / 26 UCSQB*	24,000	** 3 **	** 2 **
	18,000	2	1
31 / 32 UCSQB*	30,000	** 3 **	** 2 **
	24,000	2	1
37 / 38 UCSQB*	36,000	** 3 **	** 2 **
	30,000	2	1

Figure 26 - WD65X016, UCS-QB w/ ECM Motor 120V

WIRING DIAGRAMS CONTINUED

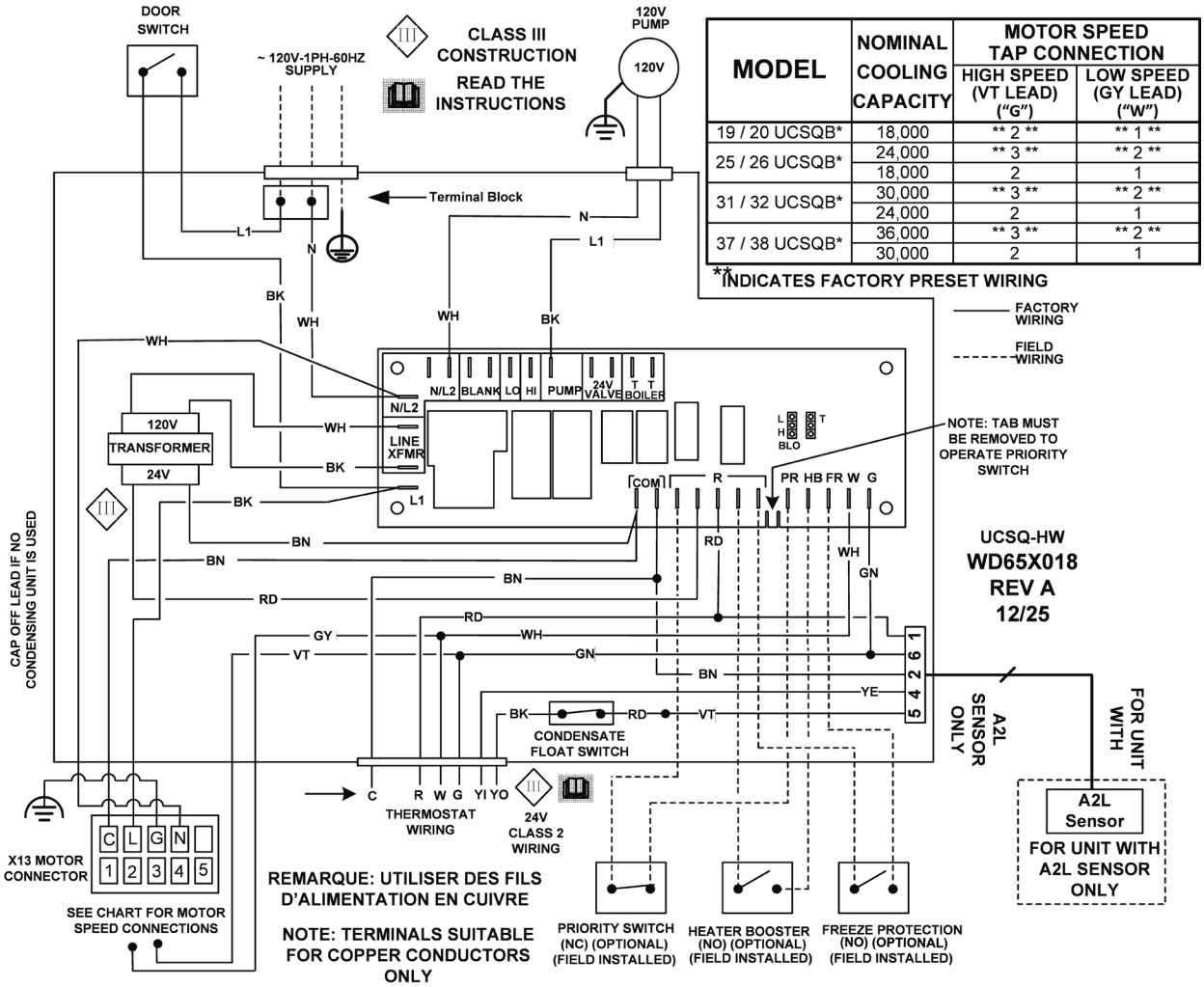


MODEL	NOMINAL COOLING CAPACITY	MOTOR SPEED TAP CONNECTION	
		HIGH SPEED (VT LEAD) ("G")	LOW SPEED (GY LEAD) ("W")
19 / 20 UCSQB*	18,000	** 2 **	** 1 **
25 / 26 UCSQB*	24,000	** 3 **	** 2 **
	18,000	2	1
31 / 32 UCSQB*	30,000	** 3 **	** 2 **
	24,000	2	1
37 / 38 UCSQB*	36,000	** 3 **	** 2 **
	30,000	2	1

** INDICATES FACTORY PRESET WIRING

Figure 27 – WD65X017, UCS-QB, w/ ECM Motor 120V

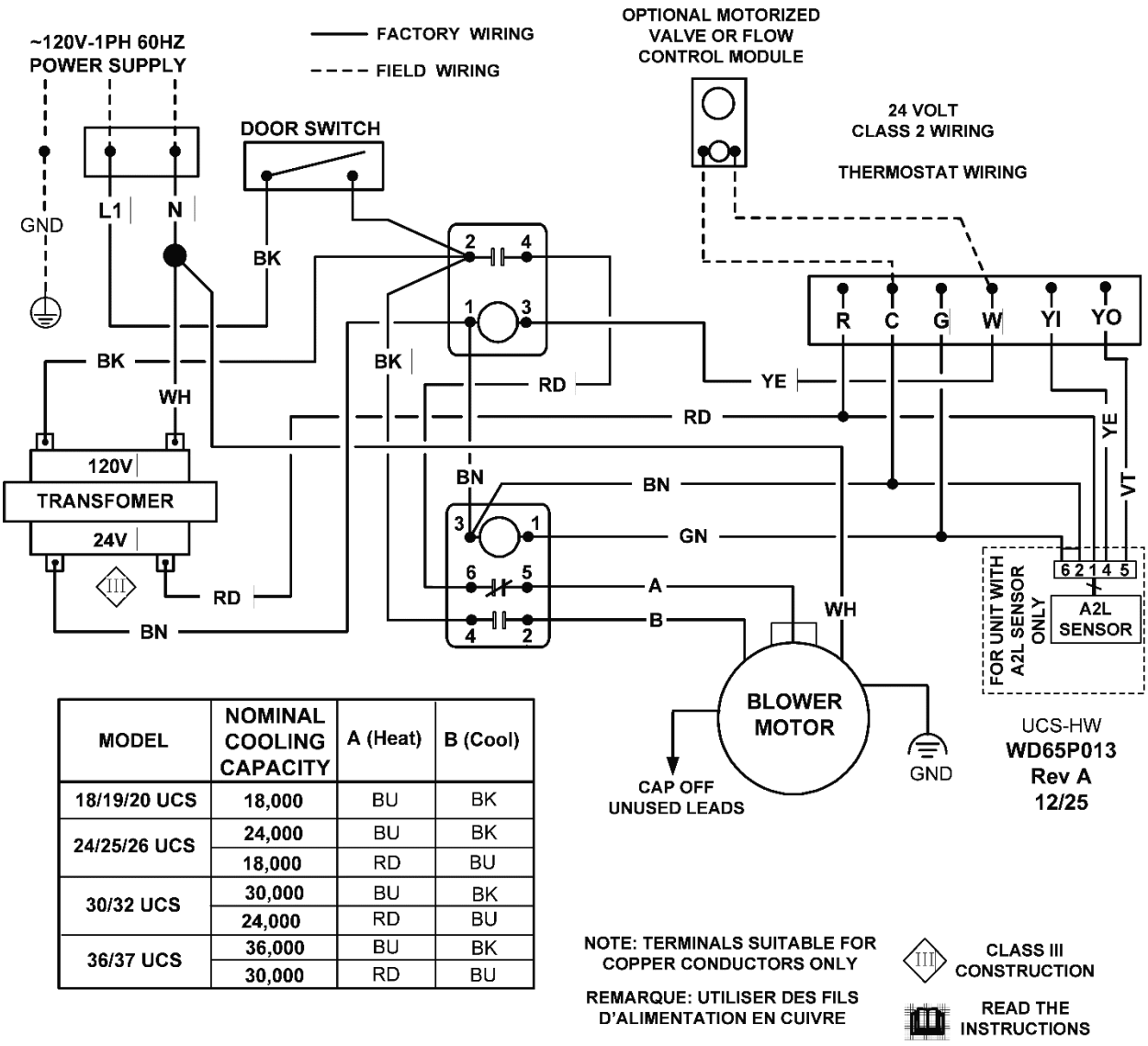
WIRING DIAGRAMS CONTINUED



MODEL	NOMINAL COOLING CAPACITY	MOTOR SPEED TAP CONNECTION	
		HIGH SPEED (VT LEAD) ("G")	LOW SPEED (GY LEAD) ("W")
19 / 20 UCSQB*	18,000	** 2 **	** 1 **
25 / 26 UCSQB*	24,000	** 3 **	** 2 **
	18,000	2	1
31 / 32 UCSQB*	30,000	** 3 **	** 2 **
	24,000	2	1
37 / 38 UCSQB*	36,000	** 3 **	** 2 **
	30,000	2	1

Figure 28 – WD65X018, UCSQ-HW w/ECM Motor 120V

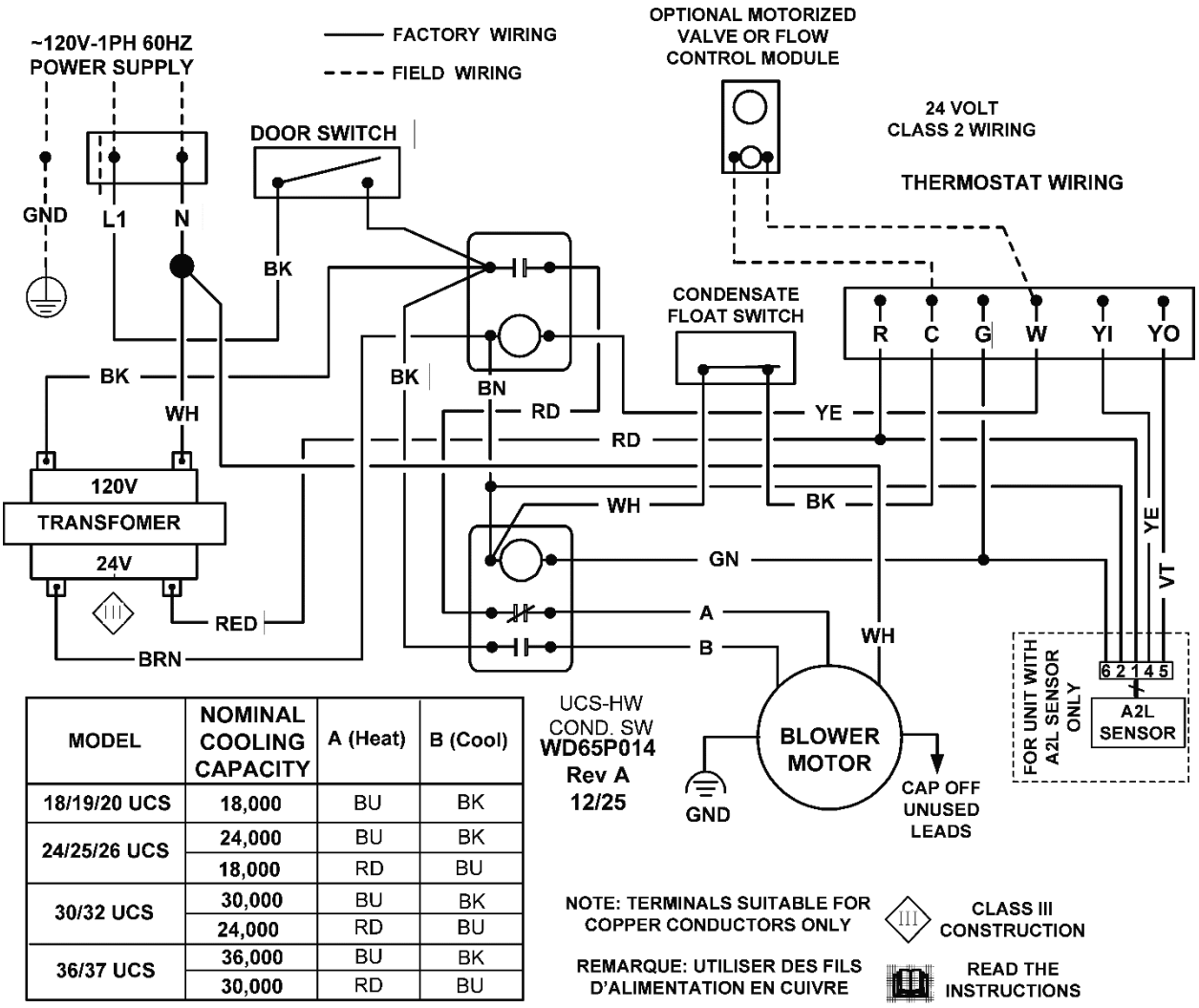
WIRING DIAGRAMS CONTINUED



MODEL	NOMINAL COOLING CAPACITY	A (Heat)	B (Cool)
18/19/20 UCS	18,000	BU	BK
24/25/26 UCS	24,000	BU	BK
	18,000	RD	BU
30/32 UCS	30,000	BU	BK
	24,000	RD	BU
36/37 UCS	36,000	BU	BK
	30,000	RD	BU

Figure 29 – WD65P013, UCS-HW 120V

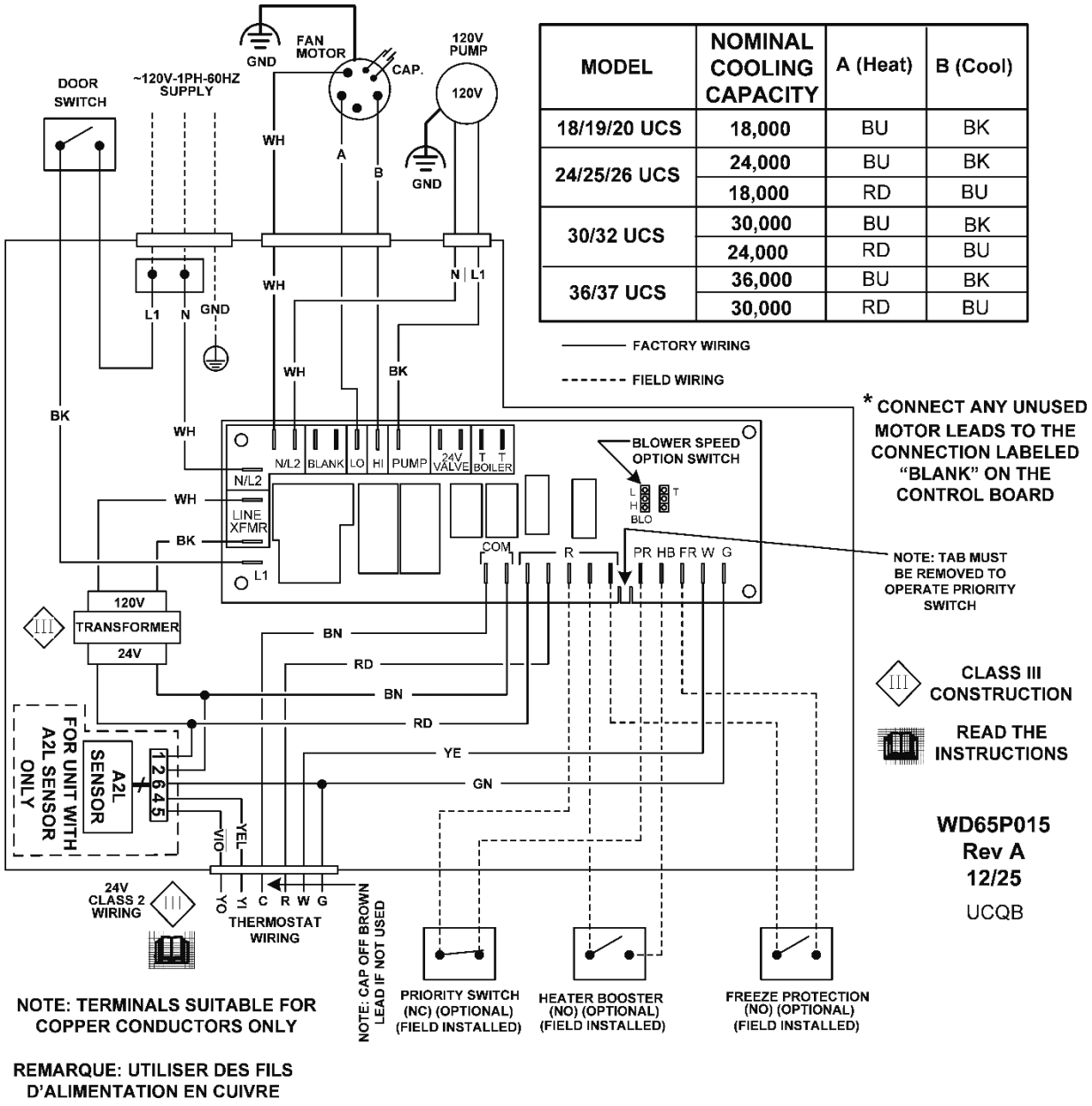
WIRING DIAGRAMS CONTINUED



MODEL	NOMINAL COOLING CAPACITY	A (Heat)	B (Cool)
18/19/20 UCS	18,000	BU	BK
24/25/26 UCS	24,000	BU	BK
	18,000	RD	BU
30/32 UCS	30,000	BU	BK
	24,000	RD	BU
36/37 UCS	36,000	BU	BK
	30,000	RD	BU

Figure 30 – WD65P014, UCS-HW Cond. SW

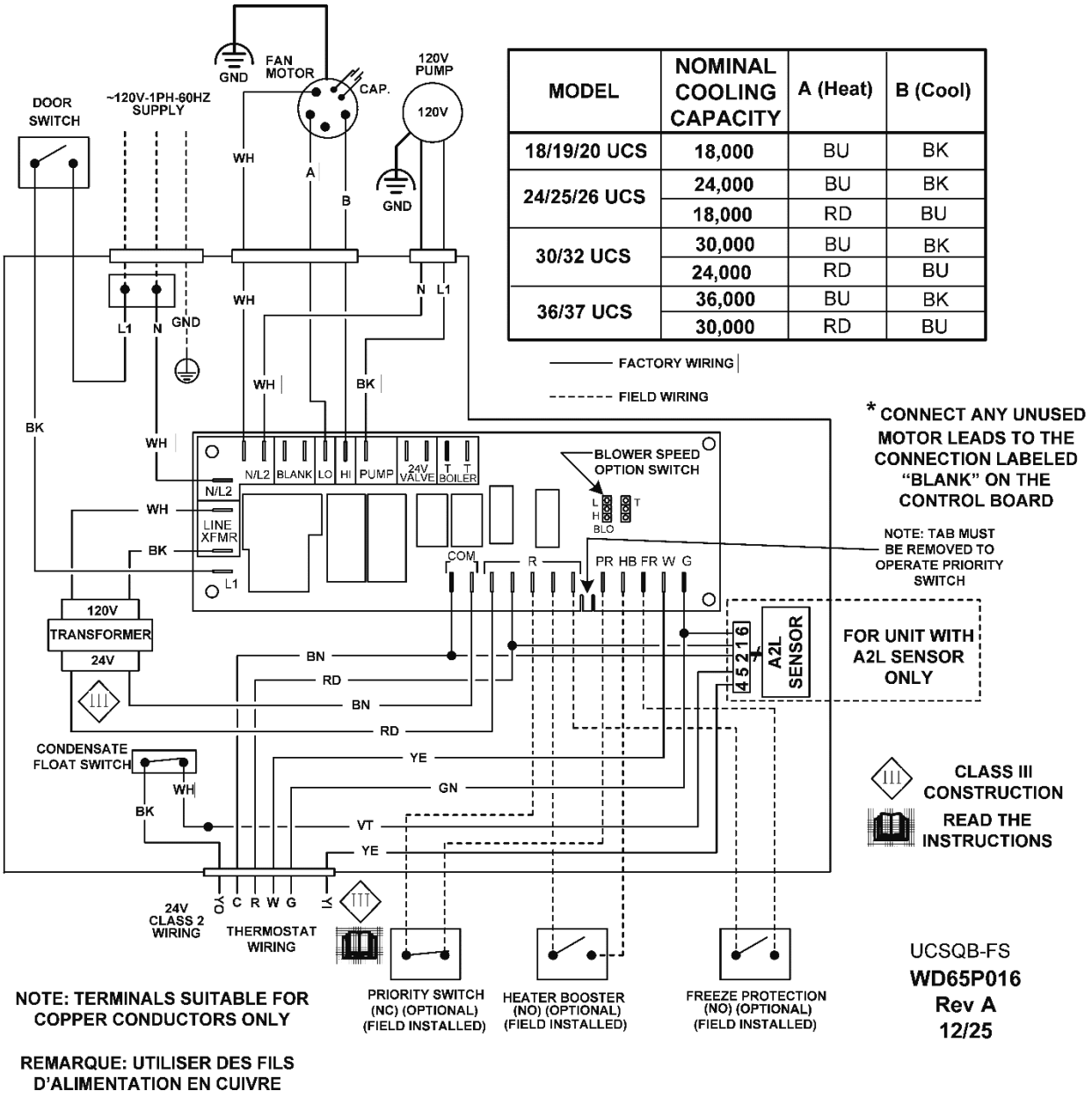
WIRING DIAGRAMS CONTINUED



MODEL	NOMINAL COOLING CAPACITY	A (Heat)	B (Cool)
18/19/20 UCS	18,000	BU	BK
24/25/26 UCS	24,000	BU	BK
	18,000	RD	BU
30/32 UCS	30,000	BU	BK
	24,000	RD	BU
36/37 UCS	36,000	BU	BK
	30,000	RD	BU

Figure 31 – WD65P015, UCQB 120V

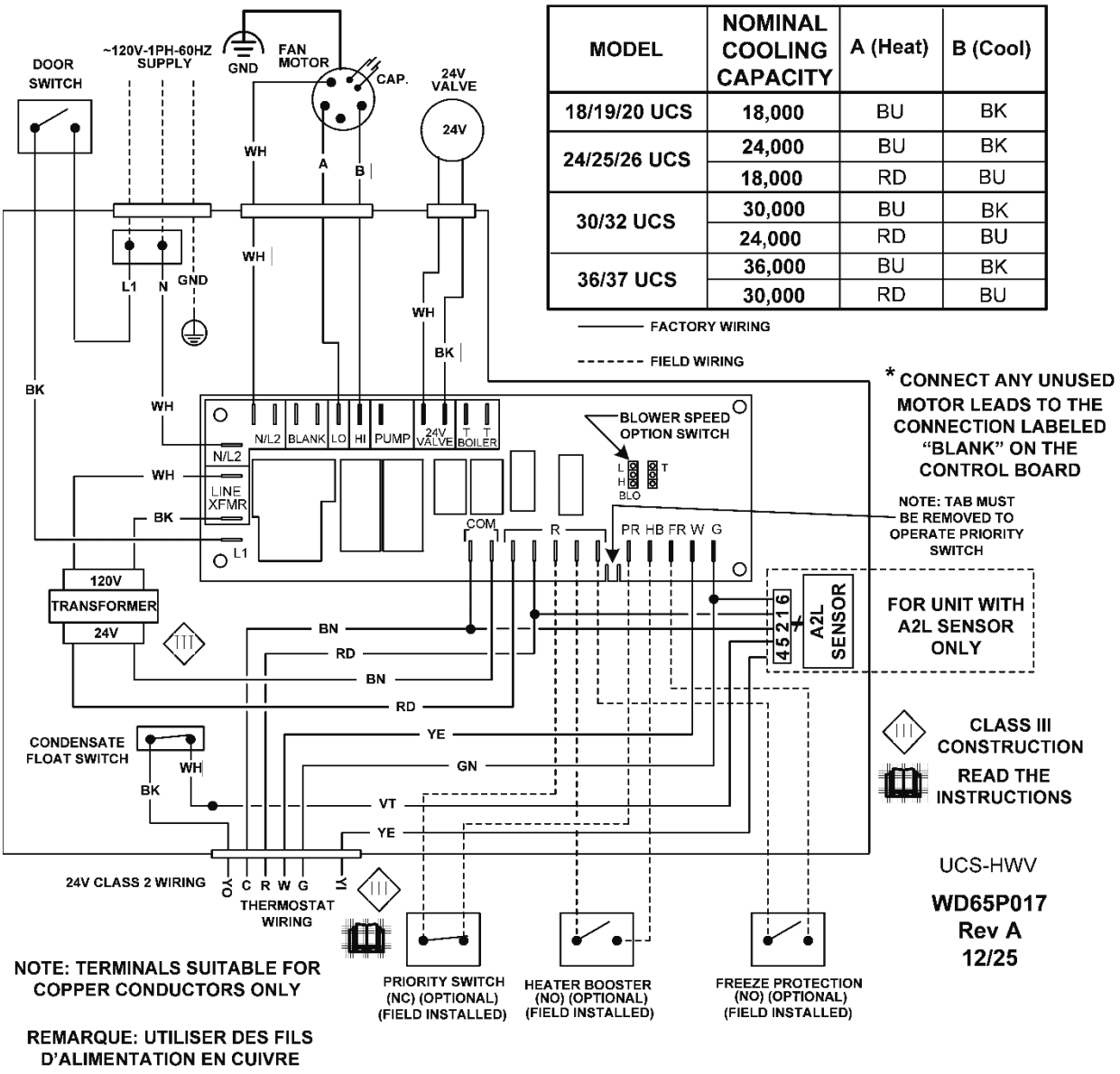
WIRING DIAGRAMS CONTINUED



MODEL	NOMINAL COOLING CAPACITY	A (Heat)	B (Cool)
18/19/20 UCS	18,000	BU	BK
24/25/26 UCS	24,000	BU	BK
	18,000	RD	BU
30/32 UCS	30,000	BU	BK
	24,000	RD	BU
36/37 UCS	36,000	BU	BK
	30,000	RD	BU

Figure 32 - WD65P016, UCSQB, Board 120V Cond. SW

WIRING DIAGRAMS CONTINUED

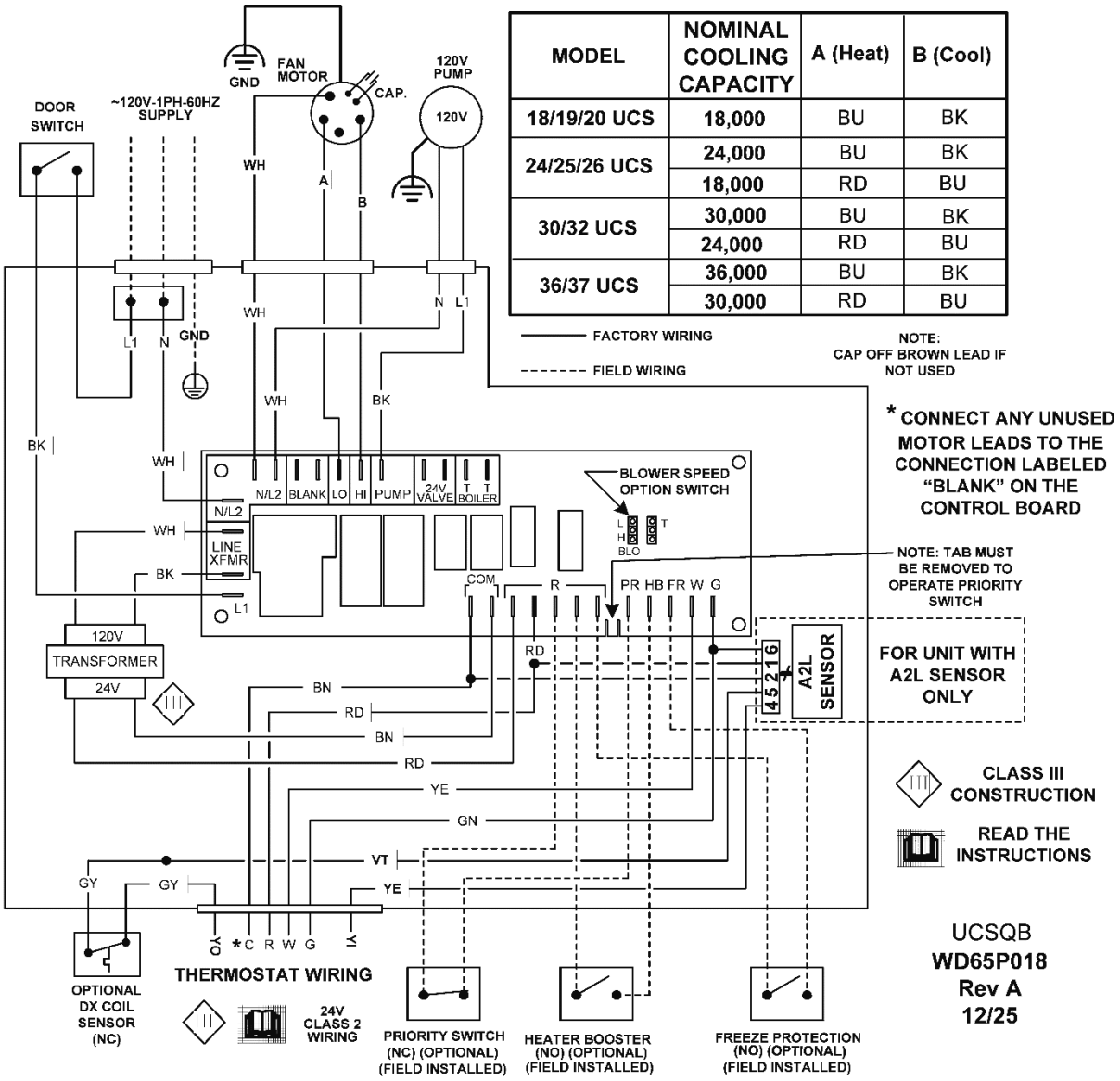


MODEL	NOMINAL COOLING CAPACITY	A (Heat)	B (Cool)
18/19/20 UCS	18,000	BU	BK
24/25/26 UCS	24,000	BU	BK
	18,000	RD	BU
30/32 UCS	30,000	BU	BK
	24,000	RD	BU
36/37 UCS	36,000	BU	BK
	30,000	RD	BU

Figure 33 - WD65P017, UCS-HW, Board 120V 24V Valve Cond. SW

WIRING DIAGRAMS CONTINUED

MODEL	NOMINAL COOLING CAPACITY	A (Heat)	B (Cool)
18/19/20 UCS	18,000	BU	BK
24/25/26 UCS	24,000	BU	BK
	18,000	RD	BU
30/32 UCS	30,000	BU	BK
	24,000	RD	BU
36/37 UCS	36,000	BU	BK
	30,000	RD	BU

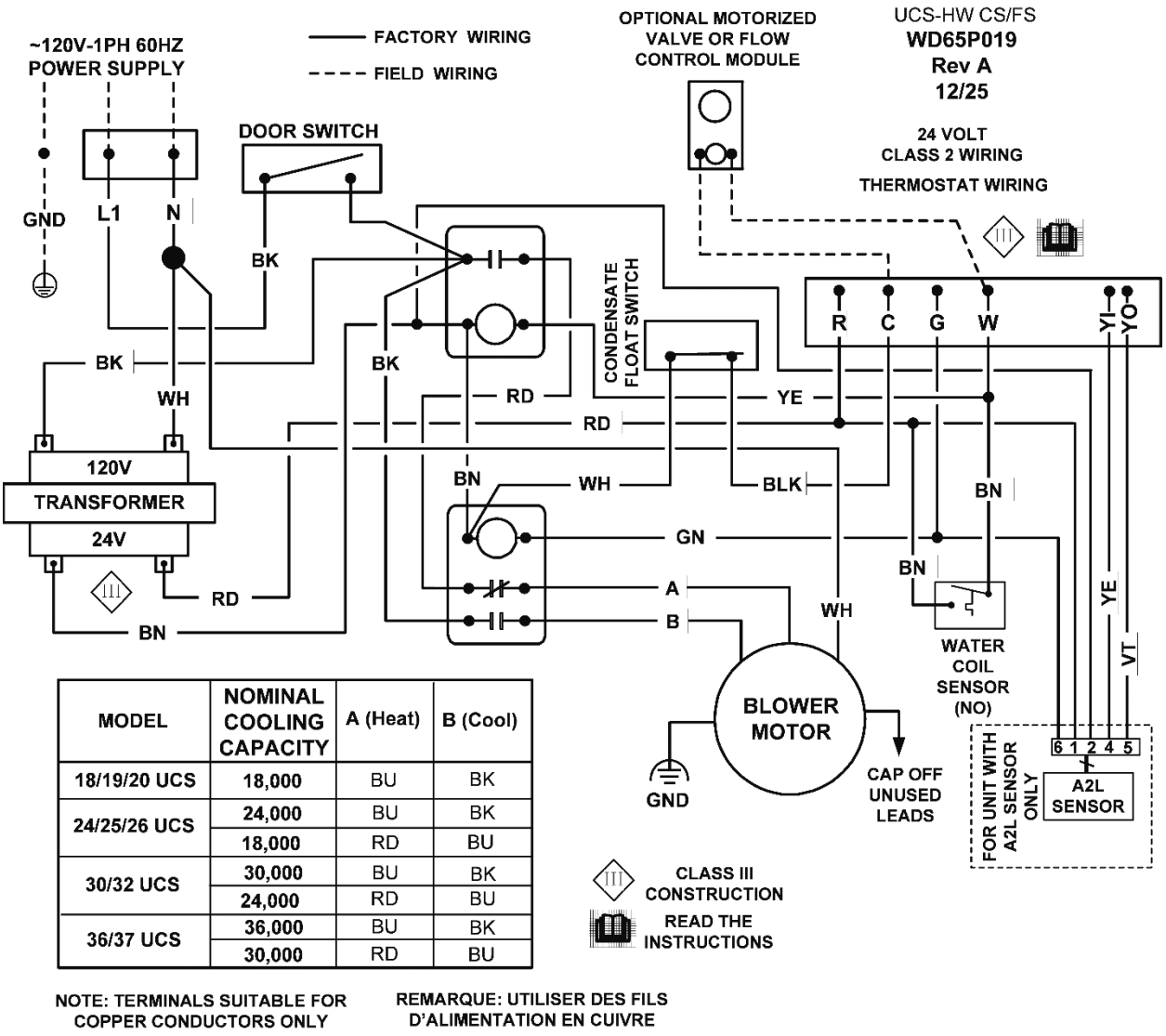


NOTE: TERMINALS SUITABLE FOR COPPER CONDUCTORS ONLY

REMARQUE: UTILISER DES FILS D'ALIMENTATION EN CUIVRE

Figure 34 - WD65P018, UCSQB 120V Board, w/Evap Sensor

WIRING DIAGRAMS CONTINUED



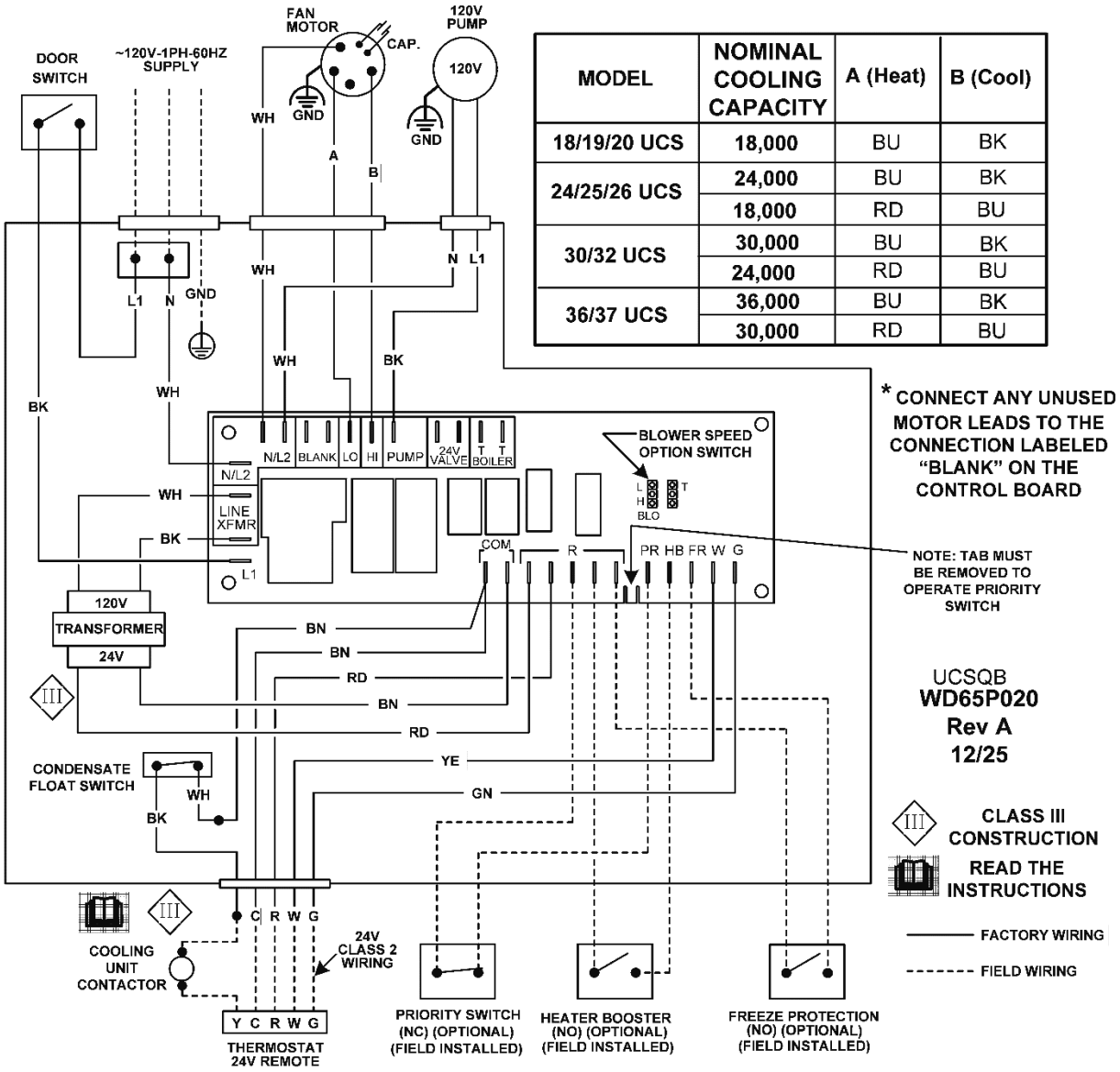
MODEL	NOMINAL COOLING CAPACITY	A (Heat)	B (Cool)
18/19/20 UCS	18,000	BU	BK
24/25/26 UCS	24,000	BU	BK
	18,000	RD	BU
30/32 UCS	30,000	BU	BK
	24,000	RD	BU
36/37 UCS	36,000	BU	BK
	30,000	RD	BU

NOTE: TERMINALS SUITABLE FOR COPPER CONDUCTORS ONLY

REMARQUE: UTILISER DES FILS D'ALIMENTATION EN CUIVRE

Figure 35 – WD65P019, UCS-HW CS/FS

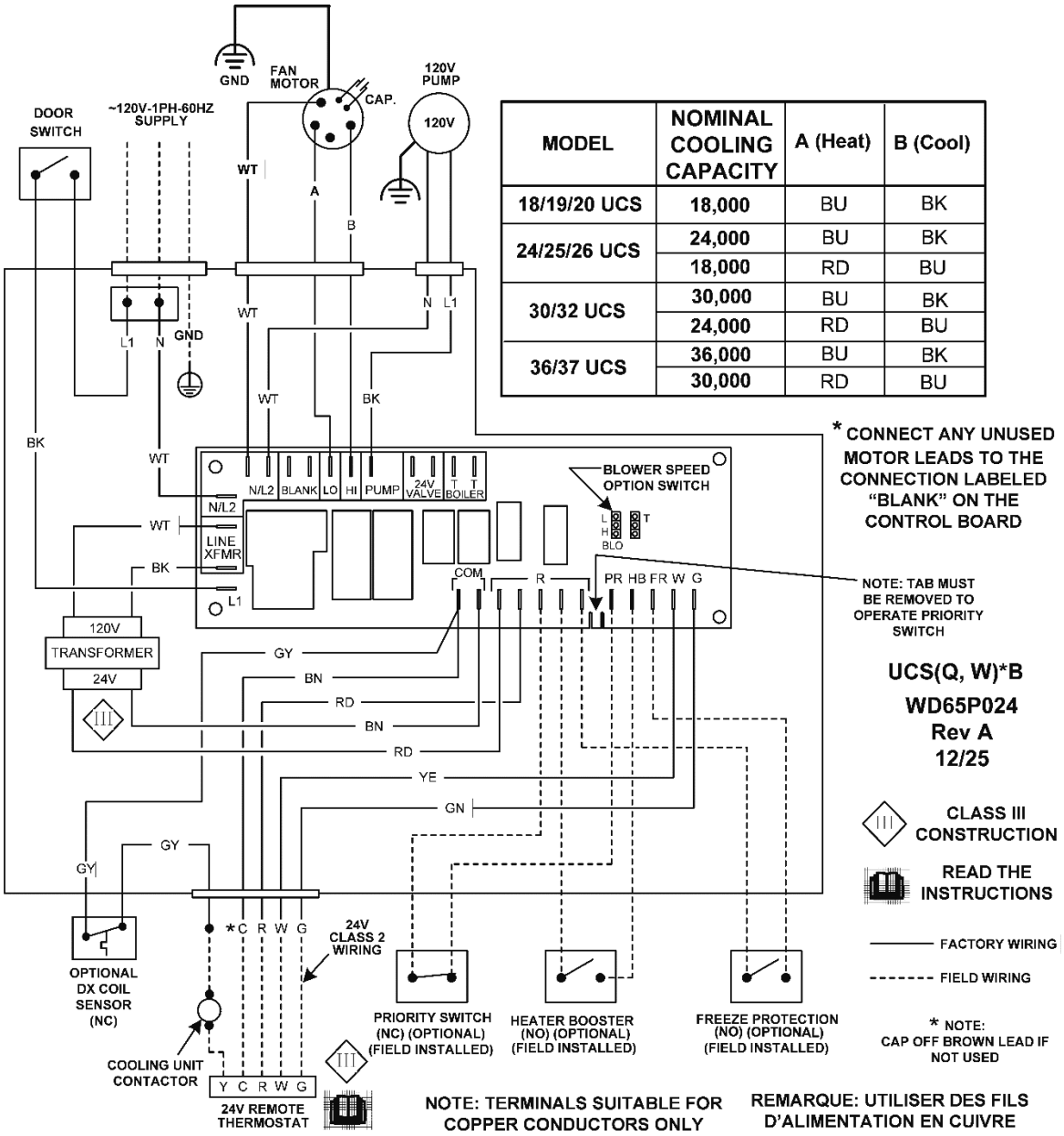
WIRING DIAGRAMS CONTINUED



MODEL	NOMINAL COOLING CAPACITY	A (Heat)	B (Cool)
18/19/20 UCS	18,000	BU	BK
24/25/26 UCS	24,000	BU	BK
	18,000	RD	BU
30/32 UCS	30,000	BU	BK
	24,000	RD	BU
36/37 UCS	36,000	BU	BK
	30,000	RD	BU

Figure 36 - WD65P020, UCSQB-Board 120V Cond. SW w/o A2L

WIRING DIAGRAMS CONTINUED



MODEL	NOMINAL COOLING CAPACITY	A (Heat)	B (Cool)
18/19/20 UCS	18,000	BU	BK
24/25/26 UCS	24,000	BU	BK
	18,000	RD	BU
30/32 UCS	30,000	BU	BK
	24,000	RD	BU
36/37 UCS	36,000	BU	BK
	30,000	RD	BU

Figure 37 - WD65P024, UCS(Q,W)*B

BLOWER PERFORMANCE UCS* w/ELECTRIC HEAT

Blower Performance: 208-230V with ECM Blower								
UNIT MODEL	CAPACITY (BTUH)	MOTOR HP (208-230V)	TAP	CFM VS. EXTERNAL STATIC PRESSURE				
				0.1	0.2	0.3	0.4	0.5
18UCS*X	18,000	1/3	T5	880	850	830	800	770
			T4	700	670	640	610	570
			T1,T2,T3	630	590	560	520	490
19UCS*X	18,000	1/3	T5	800	770	750	720	690
			T4	650	610	580	550	520
			T1,T2,T3	580	540	510	480	440
20UCS*X	18,000	1/3	T5	710	680	660	640	620
			T4	570	550	520	490	470
			T1,T2,T3	520	490	460	430	400
24UCS*X	24,000	1/3	T5	1040	1020	1000	970	940
			T4	910	890	860	480	810
			T3	780	760	730	700	670
			T1,T2	680	650	620	590	550
25UCS*X	24,000	1/3	T5	940	910	880	850	820
			T4	830	800	780	750	720
			T3	720	690	660	630	600
			T1,T2	630	600	570	530	500
26UCS*X	24,000	1/3	T5	1070	1060	1040	1020	1000
			T4	980	960	940	910	890
			T3	820	790	760	730	700
			T1,T2	690	650	620	580	550

Table 8

NOTES:

1. T3 = High Speed for all; use Violet lead.
2. T2 = Low Speed for all; use Grey lead.
3. Contact factory for correct matches with outdoor units.
4. Evaluated and listed for operation with no minimum clearance to combustible materials.
5. Add nominal .05 static if wall panel is used

BLOWER PERFORMANCE UCS* w/ELECTRIC HEAT CONTINUED

Blower Performance: 208-230V with ECM Blower								
UNIT MODEL	CAPACITY (BTUH)	MOTOR HP (208/230V)	TAP	CFM VS. EXTERNAL STATIC PRESSURE				
				0.1	0.2	0.3	0.4	0.5
30UCS*X	30,000	1/2	T5	1640	1600	1560	1520	1480
			T4	1350	1320	1290	1260	1230
			T3	1120	1080	1050	1010	970
			T1,T2	960	910	870	830	780
31UCS*X	30,000	1/2	T5	1140	1100	1060	1020	970
			T4	1020	990	960	930	900
			T3	840	810	780	760	730
			T1,T2	710	680	650	620	580
32UCS*X	30,000	1/2	T5	1570	1540	1510	1470	1440
			T4	1360	1330	1290	1260	1220
			T3	1100	1060	1020	980	940
			T1,T2	920	880	830	780	740
36UCS*X	36,000	1/2	T5	1640	1600	1560	1520	1480
			T4	1350	1320	1290	1260	1230
			T3	1120	1080	1050	1010	970
			T1,T2	960	910	870	830	780
37UCS*X	36,000	1/2	T5	1570	1540	1510	1470	1440
			T4	1360	1330	1290	1260	1220
			T3	1100	1060	1020	980	940
			T1,T2	920	880	830	780	740

Table 9

NOTES:

1. T3 = High Speed for all; use Violet lead.
2. T2 = Low Speed for all; use Grey lead.
3. Contact factory for correct matches with outdoor units.
4. Evaluated and listed for operation with no minimum clearance to combustible materials.
5. Add nominal .05 static if wall panel is used

BLOWER PERFORMANCE UCS* w/ELECTRIC HEAT CONTINUED

Blower Performance: 120V with ECM Blower								
UNIT MODEL	CAPACITY (BTUH)	MOTOR HP (120V)	TAP	CFM VS. EXTERNAL STATIC PRESSURE				
				0.1	0.2	0.3	0.4	0.5
18UCS*X	18,000	1/3	T5	800	860	830	800	770
			T4	700	670	630	600	570
			T1,T2,T3	630	590	550	520	480
19UCS*X	18,000	1/3	T5	810	780	750	720	700
			T4	640	610	570	540	510
			T1,T2,T3	580	540	500	470	430
20UCS*X	18,000	1/3	T5	710	690	670	650	630
			T4	580	550	530	500	480
			T1,T2,T3	520	490	470	440	410
24UCS*X	24,000	1/3	T5	950	930	900	870	840
			T4	840	810	780	760	730
			T3	720	690	660	630	600
			T1,T2	630	590	560	520	490
25UCS*X	24,000	1/3	T5	1040	1010	980	960	930
			T4	920	890	860	840	810
			T3	790	760	730	700	670
			T1,T2	680	650	620	580	550
26UCS*X	24,000	1/3	T5	1000	980	950	920	890
			T4	880	850	820	800	770
			T3	750	720	690	670	640
			T1,T2	660	620	590	560	530

Table 10

NOTES:

1. T3 = High Speed for all; use Violet lead.
2. T2 = Low Speed for all; use Grey lead.
3. Contact factory for correct matches with outdoor units.
4. Evaluated and listed for operation with no minimum clearance to combustible materials.
5. Add nominal .05 static if wall panel is used

BLOWER PERFORMANCE UCS* w/ELECTRIC HEAT CONTINUED

Blower Performance: 120V with ECM Blower								
UNIT MODEL	CAPACITY (BTUH)	MOTOR HP (120V)	TAP	CFM VS. EXTERNAL STATIC PRESSURE				
				0.1	0.2	0.3	0.4	0.5
30UCS*X	30,000	1/2	T5	1520	1480	1440	1400	1360
			T4	1350	1310	1280	1250	1220
			T3	1110	1080	1040	1000	970
			T1,T2	950	910	870	830	790
31UCS*X	30,000	1/2	T5	1270	1250	1230	1200	1180
			T4	1200	1180	1160	1140	1110
			T3	1050	1030	1000	980	950
			T1,T2	920	890	970	840	810
32UCS*X	30,000	1/2	T5	1440	1400	1360	1320	1280
			T4	1320	1290	1250	1220	1190
			T3	1100	1060	1020	980	950
			T1,T2	940	890	850	800	760
36UCS*X	36,000	1/2	T5	1520	1480	1440	1400	1360
			T4	1350	1310	1280	1250	1220
			T3	1110	1080	1040	1000	970
			T1,T2	950	910	870	830	790
37UCS*X	36,000	1/2	T5	1440	1400	1360	1320	1280
			T4	1320	1290	1250	1220	1190
			T3	1100	1060	1020	980	950
			T1,T2	940	890	850	800	760

Table 11

NOTES:

1. T3 = High Speed for all; use Violet lead.
2. T2 = Low Speed for all; use Grey lead.
3. Contact factory for correct matches with outdoor units.
4. Evaluated and listed for operation with no minimum clearance to combustible materials.
5. Add nominal .05 static if wall panel is used

BLOWER PERFORMANCE UCS* w/ELECTRIC HEAT CONTINUED

Blower Performance: 208-230V with PSC Blower								
UNIT MODEL	CAPACITY (BTUH)	MOTOR HP (208-230V)	TAP	STATIC PRESSURE (SCFM VS STATIC)				
				0.1	0.2	0.3	0.4	0.5
18UCS*0	18,000	1/6	High	900	870	820	780	730
			Med	720	690	660	630	590
			Low	550	530	500	470	430
19UCS*0	18,000	1/6	High	730	700	660	630	590
			Med	640	600	570	540	510
			Low	490	460	430	400	370
20UCS*0	18,000	1/6	High	650	610	570	530	490
			Med	560	530	490	450	420
			Low	530	510	500	480	470
24UCS*0	24,000	1/4	High	1010	970	930	880	830
			Med-High	910	880	840	800	750
			Med-Low	830	810	770	740	710
			Low	530	510	500	480	470
25UCS*0	24,000	1/4	High	890	850	810	760	720
			Med-High	830	780	750	700	660
			Med-Low	770	730	700	660	610
			Low	570	550	510	480	450
26UCS*0	24,000	1/4	High	890	840	790	730	680
			Med-High	800	750	710	660	600
			Med-Low	740	700	650	600	550
			Low	520	490	450	410	370

Table 13

NOTES:

1. Add nominal .05 static if wall panel is used.
2. Contact factory for correct matches with outdoor units.
3. Evaluated and listed for operation with no minimum clearance to combustible materials.

BLOWER PERFORMANCE UCS* w/ELECTRIC HEAT CONTINUED

UCS*0 208-230V PSC BLOWER DATA								
UNIT MODELE	CAPACITY (BTUH)	MOTOR HP (208-230V)	TAP	STATIC PRESSURE (SCFM VS STATIC)				
				0.1	0.2	0.3	0.4	0.5
30UCS*0	30,000	1/4	High	1360	1300	1240	1180	1110
			Med-High	1160	1120	1090	1040	980
			Med-Low	1040	1020	1000	960	910
			Low	650	630	600	580	550
31UCS*0	30,000	1/4	High	890	840	790	730	680
			Med-High	800	750	710	660	600
			Med-Low	740	700	650	600	550
			Low	520	490	450	410	370
32UCS*0	30,000	1/4	High	1200	1140	1070	1020	950
			Med-High	1110	1060	1010	950	890
			Med-Low	1050	1000	960	900	860
			Low	690	660	640	620	590
36UCS*0	36,000	1/2	High	1500	1430	1360	1270	1200
			Med-High	1430	1370	1300	1220	1150
			Med-Low	1270	1230	1180	1130	1070
			Low	1100	1080	1050	1020	970
37UCS*0	36,000	1/2	High	1290	1230	1170	1100	1040
			Med-High	1260	1200	1140	1080	1010
			Med-Low	1210	1160	1100	1040	970
			Low	1160	1110	1060	1000	940

Table 14

NOTES:

1. Add nominal .05 static if wall panel is used.
2. Contact factory for correct matches with outdoor units.
3. Evaluated and listed for operation with no minimum clearance to combustible materials.

BLOWER PERFORMANCE UCS* w/ELECTRIC HEAT CONTINUED

Blower Performance: 120V with PSC Blower									
UNIT MODEL	CAPACITY (BTUH)	MOTOR HP (120V)	MOTOR AMPS (120V)	FAN SPEED	STATIC PRESSURE (SCFM VS STATIC)				
					0.1	0.2	0.3	0.4	0.5
18UCS*0	18,000	1/4	4.7	High	790	740	710	650	610
				Medium	740	700	660	620	580
				Low	580	560	540	520	470
19UCS*0	18,000	1/4	4.7	High	750	710	670	630	580
				Medium	690	660	620	590	540
				Low	540	530	500	480	450
20UCS*0	18,000	1/4	4.7	High	720	690	650	610	570
				Medium	680	640	610	570	530
				Low	540	520	500	480	440
24UCS*0	24,000	1/2	5.6	High	860	820	770	720	680
				Medium	830	800	750	700	660
				Low	740	700	670	620	580
25UCS*0	24,000	1/2	5.6	High	770	740	700	660	610
				Medium	750	710	670	640	590
				Low	680	650	610	570	530
26UCS*0	24,000	1/2	5.6	High	850	820	780	720	650
				Medium	830	790	740	690	630
				Low	730	700	660	610	560

Table 15

BLOWER PERFORMANCE UCS* w/ELECTRIC HEAT CONTINUED

Blower Performance: 120V with PSC Blower									
UNIT MODEL	CAPACITY (BTUH)	MOTOR HP (120V)	MOTOR AMPS (120V)	FAN SPEED	STATIC PRESSURE (SCFM VS STATIC)				
					0.1	0.2	0.3	0.4	0.5
25UCS*0	24,000	1/2	5.6	High	770	740	700	660	610
				Medium	750	710	670	640	590
				Low	680	650	610	570	530
26UCS*0	24,000	1/2	5.6	High	850	820	780	720	650
				Medium	830	790	740	690	630
				Low	730	700	660	610	560
30UCS*0	30,000	3/4	5.5	High	1090	1040	990	940	890
				Medium	1020	970	920	870	820
				Low	990	950	900	860	800
32UCS*0	30,000	3/4	5.5	High	1030	970	920	860	820
				Medium	1010	960	910	850	800
				Low	990	940	890	830	780
36UCS*0	36,000	3/4	5.5	High	1090	1040	990	940	890
				Medium	1020	970	920	870	820
				Low	990	950	900	860	800
37UCS*0	36,000	3/4	5.5	High	1030	970	920	860	820
				Medium	1010	960	910	850	800
				Low	990	940	890	830	780

Table 15

BLOWER PERFORMANCE UCS* w/HYDRONIC HEAT

	Blower Performance: 120V with ECM Blower								
UNIT MODEL	NOM. CAPACITY (BTUH)	MOTOR HP (120V)	MOTOR AMPS (120V)	SPEED TAP	CFM VS. EXTERNAL STATIC PRESSURE				
					0.1	0.2	0.3	0.4	0.5
18UCS*X	18,000	1/3	4.1	T3	840	820	790	760	730
				T2	750	730	710	690	660
				T1	620	590	570	550	530
19UCS*X	18,000	1/3	4.1	T3	760	730	700	670	640
				T2	680	660	640	610	590
				T1	580	560	530	500	480
20UCS*X	18,000	1/3	4.1	T3	730	710	680	650	620
				T2	670	650	620	600	580
				T1	570	550	520	490	470
24UCS*X	24,000	1/2	6.5	T3	870	850	830	810	790
				T2	790	770	750	730	700
				T1	680	660	640	610	590
25UCS*X	24,000	1/2	6.5	T3	810	800	780	760	740
				T2	730	720	700	680	550
				T1	640	620	590	570	550
26UCS*X	24,000	1/2	6.5	T3	850	830	810	780	760
				T2	770	750	730	700	680
				T1	660	630	610	580	560
30UCS*X	30,000	1/2	6.5	T3	1100	1080	1060	1030	1010
				T2	1020	990	970	950	920
				T1	880	850	820	790	760
31UCS*X	30,000	1/2	6.5	T3	930	910	880	850	820
				T2	790	770	750	720	700
				T1	610	580	550	530	500
32UCS*X	30,000	1/2	6.5	T3	1060	1030	990	960	920
				T2	970	930	890	860	820
				T1	820	770	730	690	660
36UCS*X	36,000	1/2	6.5	T3	1140	1120	1090	1060	1030
				T2	1040	1020	1000	970	950
				T1	810	780	750	720	690
37UCS*X	36,000	1/2	6.5	T3	1080	1050	1010	980	940
				T2	990	960	920	880	850
				T1	750	700	660	620	580

Table 17

NOTES:

1. T3 = High Speed for all; use Violet lead.
2. T2 = Low Speed for all; use Grey lead.

BLOWER PERFORMANCE UCS* w/HYDRONIC HEAT CONTINUED

	Blower Performance: 120V with PSC Blower								
UNIT MODEL	NOM. CAPACITY (BTUH)	MOTOR HP (120V)	MOTOR AMPS (120V)	FAN SPEED	CFM VS. EXTERNAL STATIC PRESSURE				
					0.1	0.2	0.3	0.4	0.5
18UCS*0	18,000	1/4	4.7	High	790	740	710	650	610
				Medium	740	700	660	620	580
				Low	580	560	540	520	470
19UCS*0	18,000	1/4	4.7	High	750	710	670	630	580
				Medium	690	660	620	590	540
				Low	540	530	500	480	450
20UCS*0	18,000	1/4	4.7	High	720	690	650	610	570
				Medium	680	640	610	570	530
				Low	540	520	550	480	440
24UCS*0	24,000	1/2	5.6	High	860	820	770	720	680
				Medium	830	800	750	700	660
				Low	740	700	670	620	580
25UCS*0	24,000	1/2	5.6	High	770	740	700	660	610
				Medium	750	710	670	640	590
				Low	680	650	610	570	530
26UCS*0	24,000	1/2	5.6	High	850	820	780	720	650
				Medium	830	790	740	690	630
				Low	730	700	660	610	560
30UCS*0	30,000	1/4	5.5	High	1090	1040	990	940	890
				Medium	1020	970	920	870	820
				Low	990	950	900	860	800
32UCS*0	30,000	1/4	5.5	High	1030	970	920	860	820
				Medium	1010	960	910	850	800
				Low	990	940	890	830	780
36UCS*0	36,000	1/4	5.5	High	1090	1040	990	940	890
				Medium	1020	970	920	870	820
				Low	990	950	900	860	800
37UCS*0	36,000	1/4	5.5	High	1030	970	920	860	820
				Medium	1010	690	910	850	800
				Low	990	940	890	830	780

Table 18

NOTES:

1. High Speed = Black Lead; Medium Speed = Blue Lead; Low Speed = Red Lead

OPERATION & MAINTENANCE

WARNING

FIRE OR EXPLOSION HAZARD

Do not perform any sealed-system repair until the entire refrigerant charge has been fully recovered. Refrigerant–oil mixtures can ignite when exposed to brazing torch flames. Recover the complete refrigerant charge using both the high- and low-pressure sides of the system, then purge the sealed system with nitrogen prior to brazing any component or tubing.

Failure to follow these instructions may result in personal injury, death, and/or property damage.

WARNING

FIRE OR EXPLOSION HAZARD

Do not mix refrigerant with air for leak testing or for any other purpose. Introducing air into a refrigerant system can create a combustible mixture under pressure, leading to fire, explosion, or severe equipment damage. Only use manufacturer-approved leak-testing methods.

WARNING

ELECTRIC SHOCK HAZARD

Electrically ground the fan coil by connecting the equipment grounding conductor to the terminal marked with the ground symbol. Failure to properly ground the unit can result in serious injury or death. Always disconnect and lock out power before servicing, and verify de-energization with an approved electrical test device to prevent accidental shock.

CAUTION

Field-installed devices such as fan switches or thermostats must be wired in strict accordance with the supplied wiring diagram. Improper wiring may damage system components and will void the warranty.

PRE-START CHECK

Before starting the unit, verify the following:

Supply voltage matches the unit nameplate data.

Equipment is properly grounded in accordance with applicable codes.

Blower wheel set screws are tightened, and the blower wheels rotate freely without noise or obstruction.

Fan coil is securely mounted and installed with the required slope toward the condensate drain connection.

Condensate drain line is correctly sized, routed, trapped, pitched, and has been leak-tested for proper drainage.

A clean air filter is installed and all access panels are properly secured.

Refrigerant coil connections and field piping are leak-free and fully insulated to prevent condensation.

All cabinet penetrations (knockouts, wiring entries, piping openings) are sealed to maintain low air leakage and prevent condensation issues.

START-UP AND MAINTENANCE

Before start-up, perform the following checks:

Clean all components to remove construction debris and prevent operational issues.

Verify that all access panels and filters are correctly installed and secured.

Confirm overall unit cleanliness and ensure all rotating components are properly secured and unobstructed.

FAN

Inspect and clean the fan assembly at least annually, preferably in conjunction with motor and bearing service. Maintain clean fan wheels to prevent imbalance, vibration, and reduced airflow performance.

MOTOR

Verify that all motor electrical connections are secure and match the unit's wiring diagram.
ECM motors have continuous line-voltage power—ensure all power is disconnected and locked out prior to servicing.

FILTER

Replace or clean the air filter at least every 30 days, or more frequently under high-dust or severe operating conditions. Always use a filter of the same type and rating as originally provided with the unit.

OPERATION AND MAINTENANCE CONTINUED

COIL

Remove dust or contaminants from coil heat-transfer surfaces using one of the following approved methods:

Low-pressure compressed air.

Water flushing; apply a mild detergent when cleaning coils with grease or heavy residue.

DRAIN PIPING

Ensure the drain is:

- Properly connected and sloped away from the unit (1/8" per foot [9.84 mm per meter] minimum).
- Checked before summer operation and periodically during operation.

PREVENTATIVE MAINTENANCE

To ensure maximum performance and extend the service life of the equipment, a formal schedule of regular maintenance should be established and strictly followed.

QUALIFICATION OF PERSONNEL

All service, maintenance, and repair work shall be performed only by qualified technicians who have been certified by nationally recognized training organizations or manufacturers accredited to teach the applicable national competency standards as required by governing legislation.
Technicians must possess and maintain documented proof of competency, such as a valid certificate of qualification, demonstrating their ability to service this appliance properly and safely.

WORK AREA SAFETY CHECKS

Before beginning any work on the appliance, perform safety inspections to ensure the risk of igniting released gases is minimized. All work shall be conducted under controlled conditions to reduce the likelihood of flammable gas or vapor presence during servicing or maintenance.
All personnel working in or near the area must be informed of the nature of the work being performed and the associated safety precautions. Work in confined spaces must be strictly avoided.

REFRIGERANT PRESENCE AND SAFETY CHECKS

Before and during any work, the area must be inspected with an approved refrigerant detector to identify the presence of potentially toxic or flammable atmospheres. Ensure the leak detection equipment is specifically rated for the refrigerant in use—non-sparking, properly sealed, or intrinsically safe.
If any hot work is to be performed on the refrigeration equipment or related components, appropriate fire suppression equipment—such as a dry powder or CO_2 extinguisher—must be readily available near the work area.

Personnel working on refrigeration systems must not use any ignition sources that could result in fire or explosion hazards. All potential ignition sources, including open flames, sparks, or smoking materials, must be kept at a safe distance from the installation, repair, removal, or disposal area where refrigerant may be released.
Before beginning work, survey the surrounding area to confirm the absence of flammable materials and ignition risks. Clearly post and enforce "NO SMOKING" signage in all applicable work zones.

VENTILATED WORK AREA

Before opening the refrigeration system or performing any hot work, confirm that the area is either outdoors or adequately ventilated. Proper ventilation must be maintained throughout the duration of the work to ensure the safe dispersion of any released refrigerant. Whenever possible, ventilation should be directed to exhaust refrigerant vapors safely to the outside atmosphere, away from occupied or enclosed spaces.

OPERATION AND MAINTENANCE CONTINUED

INSPECTION OF REFRIGERANT EQUIPMENT

When replacing electrical components, ensure that all parts are properly rated, suitable for their intended purpose, and meet the specified requirements. Always adhere to the manufacturer's maintenance and service guidelines. If uncertainty arises, contact the manufacturer's technical department for clarification or assistance.

For installations utilizing flammable refrigerants, the following checks must be performed:

- Verify that the refrigerant charge corresponds appropriately to the room size in which refrigerant-containing components are installed.
- Confirm that ventilation systems and outlets are functioning correctly and are free from obstructions.
- Ensure that all equipment markings and safety labels are clearly visible and legible; any damaged or missing markings must be replaced.
- Check that refrigerant piping and components are located and protected to prevent exposure to corrosive substances, unless the materials are inherently resistant to corrosion or adequately coated for protection.

INSPECTION OF ELECTRICAL DEVICES AND SEALED ELECTRICAL COMPONENTS

All repair and maintenance work involving electrical components must begin with comprehensive safety checks and visual inspections. If any condition is identified that could compromise safety, do not connect electrical power to the circuit until the issue has been fully corrected. If immediate correction is not possible but temporary operation is required, implement an appropriate interim solution, and promptly report the condition to the equipment owner to ensure all parties are informed.

Initial Safety Checks shall include:

- Confirm that all capacitors are fully discharged using safe procedures to prevent arcing or sparking.
- Verify that no live electrical components or wiring are exposed during charging, refrigerant recovery, or purging operations.
- Ensure continuity of the grounding (earth) bond throughout the system.
- Any sealed electrical component found to be damaged, malfunctioning, or compromised must be replaced in full – repairs are not permitted.

LABELING INSPECTION

Verify that all cabling is protected from wear, corrosion, excessive pressure, vibration, sharp edges, and other potentially damaging environmental factors. Consider the long-term effects of aging and continuous vibration from equipment such as compressors or fans to ensure reliable and safe operation.

REMOVAL AND EVACUATION OF FLAMMABLE REFRIGERANTS

When opening the refrigerant circuit for repairs or maintenance, standard service procedures shall be observed. However, additional precautions are required when handling flammable refrigerants (A2L, A3, etc.) to ensure safety.

The following best practices shall be strictly followed:

- Recover the refrigerant charge in accordance with all applicable local, state, and national regulations.
- Purge the circuit with inert gas (such as oxygen-free nitrogen); this step is optional for A2L refrigerants.
- Evacuate the system if required (optional for A2L refrigerants).
- If a flame is to be used to open the circuit (e.g., for brazing), the system shall be continuously flushed with inert gas during the process.
- The circuit may then be opened by cutting or brazing.

OPERATION AND MAINTENANCE CONTINUED

The recovered refrigerant must be stored only in approved recovery cylinders if venting is not permitted by law. For systems containing flammable refrigerants, purge with oxygen-free nitrogen to render the system safe. This process may need to be repeated several times to ensure complete removal of refrigerant. Compressed air or oxygen shall never be used for purging refrigerant systems.

For appliances using flammable refrigerants, purging shall involve:

1. Breaking the vacuum in the system with oxygen-free nitrogen.
2. Pressurizing to working pressure, then venting to atmosphere.
3. Pulling a vacuum again (optional for A2L refrigerants).
4. Repeating this sequence until no refrigerant remains in the system.

After the final nitrogen charge, the system shall be vented down to atmospheric pressure before any work begins.
The vacuum pump outlet shall be located away from potential ignition sources, and adequate ventilation shall be provided throughout the process.

LABELING

Equipment must be clearly labeled to indicate that it has been decommissioned and fully emptied of refrigerant. Each label must include the date and the signature of the responsible person. For appliances containing flammable refrigerants, ensure that additional labels are affixed stating: “Contains Flammable Refrigerant.”

REFRIGERANT DETECTION SENSOR (RDS) INFORMATION

Any field-installed wiring connected to the RDS must be at least 18 AWG with a minimum insulation thickness of 1.58 mm, or otherwise protected from damage.
The RDS is not intended for service or repair. In the event of a sensor failure, the system will enter mitigation mode. The failed sensor must be replaced by removing it and installing a new sensor. Only sensors specified by the appliance manufacturer may be used for refrigerant detection systems.

DUCTING

If an appliance using A2L refrigerants is connected via an air duct system to one or more rooms and is installed in a space smaller than the minimum area specified in the unit’s physical data table, or if the effective dispersal volume is less than 18 m^3 (636 ft^3), the following conditions shall apply:

- The room shall not contain continuously operating open flames (e.g., gas appliances) or other potential ignition sources, such as operating electric heaters or hot surfaces.
- A flame-producing device may be installed in the same space only if it is equipped with an effective flame arrestor.
- Auxiliary devices that may constitute an ignition source shall not br installed within the ductwork. Potential ignition sources include:
    - Hot surfaces with temperatures exceeding 430°C (806°F)
    - Electric switching devices.

PIPING

All piping materials, routing, and installation shall incorporate adequate protection against physical damage during operation and servicing. Installation must comply with all applicable national and local codes and standards, including but not limited to ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, and CSA B52.
All field-fabricated joints shall remain fully accessible for inspection prior to being covered or enclosed.

OPERATION AND MAINTENANCE CONTINUED

FLAMMABLE REFRIGERANT LEAK DETECTION

Under no circumstances should any potential source of ignition be used to detect refrigerant leaks.
Halide torches or any leak-detection device that uses an open flame are strictly prohibited.

Acceptable leak detection methods include the following:

- Electronic Leak Detectors
  Electronic detection instruments may be used; however, when working with flammable refrigerants:
  - Ensure the detector provides sufficient sensitivity for the refrigerant type.
  - Verify the device poses no ignition risk and is specifically rated for the refrigerant in use.
  - Calibrate the detector in a refrigerant-free environment.
  - Set the detection threshold to a percentage of the refrigerant's Lower Flammability Limit (LFL), not exceeding 25% of LFL.
  - Confirm calibration parameters match the refrigerant employed.
  - Leak Detection Fluids
- Leak detection fluids, such as bubble solutions or fluorescent agents, are acceptable.
  - Do not use chlorine-based detergents, as these can react with the refrigerant and cause corrosion of copper tubing.

Important Safety Note

If a refrigerant leak is suspected:

- Extinguish all open flames immediately.
- For repairs requiring brazing, recover the entire refrigerant charge or isolate the refrigerant to a remote section of the system using appropriate shut-off valves.
- Refrigerant removal must be performed using approved recovery and evacuation procedures.

OPERATION & MAINTENANCE CONTINUED

A2L SENSING AND MITIGATION

Air handler units designed to be charged with more than 4 lbs (1.81 kg) of R454B or R32 refrigerant are equipped with a factory-installed refrigerant leak detector located near the bottom of the evaporator coil.

Operation in the event of a leak:

- When a refrigerant leak is detected, the unit's controls will disable compressor operation and energize the evaporator fan to disperse the leaked refrigerant.
- The unit will remain in this mitigation state until the sensor no longer detects a refrigerant leak, for a minimum duration of 5 minutes.
- After the mitigation period ends, the unit resumes normal operation according to current thermostat inputs.
- An LED status light is provided on the sensor for diagnostic purposes. Descriptions of the LED status signals are detailed in the following table.

Status Light Table for Refrigerant Detection System (RDS)		
Status Light	State / Condition	System Response
Green Blinking	Normal Operation	- The system is actively monitoring refrigerant levels. - No refrigerant detected above the activation threshold. - Outdoor unit compressor and indoor blower operate normally.
Red Continuous	Refrigerant Leak Detected	- Refrigerant concentration exceeds the activation threshold. - The outdoor unit compressor (Y) is turned off to prevent further circulation of refrigerant. - The indoor blower is turned on to recirculate air and mitigate the refrigerant concentration.
Red Blinking	Fault Detected	- A fault in the refrigerant detection system (e.g., calibration issue, end-of-life) has been detected. - The outdoor unit compressor (Y) and indoor blower mitigation mode are deactivated for safety. - System requires inspection or replacement.
No Light	System Off or Malfunction	- The system is not operational. - Check the power supply and all system connections.
Amber Blinking	System Initializing	- The system is warming up after power-up. - The outdoor unit compressor (Y) and indoor blower mitigation mode remain inactive during this phase. - Transitions to green blinking when monitoring begins.

Table 19

MINIMUM ROOM SIZE AND MITIGATION AIRFLOW

These fan-coil units are compatible with both A1 and A2L refrigerants. When using A2L refrigerants, additional critical components are required. If the unit is not factory-configured for A2L refrigerants, a field-installed kit, designed for the specific refrigerant, must be installed to ensure that any refrigerant leak is properly detected and automatically mitigated.

Units charged with A2L refrigerants also require:

- A minimum room size for safe operation.
- A minimum mitigation airflow to ensure proper dispersion of leaked refrigerant.

Both the minimum room size and required mitigation airflow are determined based on the total refrigerant charge, which is the sum of:

1. The charge listed on the outdoor unit nameplate.
2. Any additional refrigerant added during system installation.

R32: Minimum Airflow and Room Size by Charge

System Charge of R32		Min Circulation Airflow		Minimum Room Area							
				1.8 m (6 ft) Ceiling/Release Height		2.4 m (8 ft) Ceiling/Release Height		3 m (10 ft) Ceiling/Release Height		3.6 m (12 ft) Ceiling/Release Height	
kg	lbs	m^3/hr	CFM	m^2	ft^2	m^2	ft^2	m^2	ft^2	m^2	ft^2
1.8	4	178	105	6.6	71	4.9	53	4	43	3.3	35
2.3	5	222	131	8.2	89	6.2	66	4.9	53	4.1	44
2.7	6	267	157	9.9	106	7.4	80	5.9	64	4.9	53
3.2	7	311	183	11.5	124	8.6	93	6.9	74	5.8	62
3.6	8	356	209	13.2	142	9.9	106	7.9	85	6.6	71
4.1	9	400	236	14.8	159	11.1	120	8.9	96	7.4	80
4.5	10	445	262	16.5	177	12.4	133	9.9	106	8.2	89
5	11	489	288	18.1	195	13.6	146	10.9	117	9.1	97
5.4	12	534	314	19.8	213	14.8	159	11.9	128	9.9	106
5.9	13	578	340	21.4	230	16.1	173	12.8	138	10.7	115
6.3	14	622	366	23.1	248	17.3	186	13.8	149	11.5	124
6.8	15	667	393	24.7	266	18.5	199	14.8	159	12.4	133
7.3	16	711	419	26.3	284	19.8	213	15.8	170	13.2	142
7.7	17	756	445	28	301	21	226	16.8	181	14	151
8.2	18	800	471	29.6	319	22.2	239	17.8	191	14.8	159
8.6	19	845	497	31.3	337	23.5	252	18.8	202	15.6	168
9.1	20	889	523	32.9	354	24.7	266	19.8	213	16.5	177
9.5	21	934	550	34.6	372	25.9	279	20.7	223	17.3	186
10	22	978	576	36.2	390	27.2	292	21.7	234	18.1	195
10.4	23	1023	602	37.9	408	28.4	306	22.7	245	18.9	204
10.9	24	1067	628	39.5	425	29.6	319	23.7	255	19.8	213
11.3	25	1112	654	41.2	443	30.9	332	24.7	266	20.6	221
11.8	26	1156	680	42.8	461	32.1	346	25.7	276	21.4	230
12.2	27	1200	707	44.5	478	33.3	359	26.7	287	22.2	239
12.7	28	1245	733	46.1	496	34.6	372	27.7	298	23.1	248
13.2	29	1289	759	47.8	514	35.8	385	28.7	308	23.9	257
13.6	30	1334	785	49.4	532	37.1	399	29.6	319	24.7	266

Table 20

MINIMUM ROOM SIZE AND MITIGATION AIRFLOW CONTINUED

R454B: Minimum Airflow and Room Size by Charge											
System charge of R454B		Min Circulation Airflow		Minimum Room Area							
				1.8 m (6 ft) Ceiling/Release Height		2.4 m (8 ft) Ceiling/Release Height		3 m (10 ft) Ceiling/Release Height		3.6 m (12 ft) Ceiling/Release Height	
kg	lbs	m^3/hr	CFM	m^2	ft^2	m^2	ft^2	m^2	ft^2	m^2	ft^2
1.8	4	184	108	6.8	73	5.1	55	4.1	44	3.4	37
2.3	5	230	135	8.5	92	6.4	69	5.1	55	4.3	46
2.7	6	276	162	10.2	110	7.7	82	6.1	66	5.1	55
3.2	7	322	189	11.9	128	8.9	96	7.2	77	6	64
3.6	8	368	216	13.6	147	10.2	110	8.2	88	6.8	73
4.1	9	414	243	15.3	165	11.5	124	9.2	99	7.7	82
4.5	10	460	271	17	183	12.8	137	10.2	110	8.5	92
5	11	506	298	18.7	201	14	151	11.2	121	9.4	101
5.4	12	552	325	20.4	220	15.3	165	12.3	132	10.2	110
5.9	13	598	352	22.1	238	16.6	179	13.3	143	11.1	119
6.3	14	644	379	23.8	256	17.9	192	14.3	154	11.9	128
6.8	15	689	406	25.5	275	19.2	206	15.3	165	12.8	137
7.3	16	735	433	27.2	293	20.4	220	16.3	176	13.6	147
7.7	17	781	460	28.9	311	21.7	234	17.4	187	14.5	156
8.2	18	827	487	30.6	330	23	247	18.4	198	15.3	165
8.6	19	873	514	32.3	348	24.3	261	19.4	209	16.2	174
9.1	20	919	541	34	366	25.5	275	20.4	220	17	183
9.5	21	965	568	35.8	385	26.8	289	21.5	231	17.9	192
10	22	1011	595	37.5	403	28.1	302	22.5	242	18.7	201
10.4	23	1057	622	39.2	421	29.4	316	23.5	253	19.6	211
10.9	24	1103	649	40.9	440	30.6	330	24.5	264	20.4	220
11.3	25	1149	676	42.6	458	31.9	343	25.5	275	21.3	229
11.8	26	1195	703	44.3	476	33.2	357	26.6	286	22.1	238
12.2	27	1241	730	46	495	34.5	371	27.6	297	23	247
12.7	28	1287	758	47.7	513	35.8	385	28.6	308	23.8	256
13.2	29	1333	785	49.4	531	37	398	29.6	319	24.7	266
13.6	30	1379	812	51.1	550	38.3	412	30.6	330	25.5	275

Table 21

For installations in locations above 800 meters the room size and mitigation airflow must be adjusted with a factor from this chart

Altitude Correction Factor													
Altitude(m)	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200
Altitude (ft)	2625	3281	39.7	4693	5349	5349	5906	6562	7874	8530	9186	9843	10499
Adj. Factor (AF)	1.02	1.05	1.07	1.1	1.12	1.12	1.15	1.18	1.25	1.28	1.32	1.36	1.4

Table 22

STARTUP & PERFORMANCE CHECKLIST

For extended warranty registration, email form to **returns@firstco.com**
For startup assistance, email form to **techsupport@firstco.com**

CUSTOMER: _____ DATE: _____ STARTUP DATE: _____
ADDRESS: _____ PHONE #: _____ JOB #: _____
INSTALLING CONTRACTOR: _____ TECHNICIAN: _____
MODEL #: _____ SERIAL #: (ex: A-12-B-345678) _____

Air Handler Information:

Brand: _____ Model Number: _____ Serial Number: _____
Metering Device: Piston ☐ TXV Hard Shut-off ☐ TXV Rapid Bleed ☐

Multi Voltage: _____ Amps: _____
Cooling Speed: _____ Heating Speed: _____

Evaporator Coil Temperatures:

Evaporator Coil EAT Dry Bulb: _____ Evaporator Coil LAT Dry Bulb: _____ Delta: _____

Evaporator Coil EAT Wet Bulb: _____ Evaporator Coil LAT Wet Bulb: _____ Delta: _____

Condensing Unit:

Unit Voltage: _____ Compressor Voltage: _____
Amps: _____ Discharge Line Temp: _____

Min Circuit Amps (MCA): _____ Max Overcurrent Amps (MCO): _____
Breaker/Fuse Size: _____ Wire Size: _____

Start Kit: Yes ☐ No ☐ Recommended: Kickstart or similar kit with a potential relay only—do not use solid state kits.

Refrigerant Pressures/Temperatures: Outdoor Ambient Temp: _____

Low Side PSIG: _____ {Vapor Line Temp: ___ **minus** Saturated Temp: ___ = ___ degrees of **Superheat**}

High Side PSIG: _____ {Saturated Temp: ___ **minus** Liquid Line Temp: ___ = ___ degrees of **Sub-cooling**}

STARTUP & PERFORMANCE CHECKLIST (continued)

For extended warranty registration, email form to **returns@firstco.com**
For startup assistance, email form to **techsupport@firstco.com**

PROBLEM SUMMARY

CORRECTIVE ACTIONS TAKEN

The warranty shall be considered void unless the Startup & Performance Checklist is properly completed and submitted to the warrantor. In addition, any failure to install the unit in accordance with the manufacturer's published instructions and applicable codes shall render the warranty null and void. The manufacturer shall not be held liable for any damages, failures, or performance issues arising from improper installation, adjustment, or application of the equipment.

NOTES

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