

# INSTALLATION MANUAL

## STANDARD PSC MODULAR MULTI-POSITION AIR HANDLERS

MODELS: MP SERIES



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## SECTION I: GENERAL

The MP modular air handler series provides the flexibility for installation in any position. This unit may be used for upflow, downflow, horizontal right, or horizontal left applications.

These units may be located in a closet, utility room, attic, crawl space, or basement. These versatile models may be used for cooling or heat pump operation with or without electric heat or indoor coil.

Top or side power and control wiring, color coded leads for control wiring, and electric heaters all combine to make the installation easy and minimize installation cost.

Electric heat kits are available as field installed accessories. Single phase kits are available from 2.5 kW to 25 kW. 208-230 volt three phase kits are available from 10kW to 25kW.

## SECTION II: SAFETY



This is a safety alert symbol. When you see this symbol on labels or in manuals, be alert to the potential for personal injury.

Understand and pay particular attention to the signal words **DANGER**, **WARNING**, or **CAUTION**.

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

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

**CAUTION** indicates a potentially hazardous situation, which, if not avoided **may result in minor or moderate injury**. It is also used to alert against unsafe practices and hazards involving only property damage.

### ⚠ WARNING

#### **FIRE OR ELECTRICAL HAZARD**

*Failure to follow the safety warnings exactly could result in serious injury, death or property damage. A fire or electrical hazard may result causing property damage, personal injury or loss of life.*

### ⚠ WARNING

*The air handler area must not be used as a broom closet or for any other storage purposes, as a fire hazard may be created. Never store items such as the following on, near or in contact with the furnace.*

1. Spray or aerosol cans, rags, brooms, dust mops, vacuum cleaners or other cleaning tools.
2. Soap powders, bleaches, waxes or other Cleaning compounds; plastic items or containers; gasoline, kerosene, cigarette lighter fluid, dry cleaning fluids or other volatile fluid.
3. Paint thinners and other painting compounds.
4. Paper bags, boxes or other paper products

*Never operate the air handler with the blower door removed. To do so could result in serious personal injury and/or equipment damage.*

**⚠ WARNING**

Improper installation, adjustment, alteration, or maintenance may create a condition where the operation of the product could cause personal injury or property damage. Refer to this manual for assistance, or for additional information, consult a qualified contractor, installer, or service agency.

**⚠ CAUTION**

This product must be installed in strict compliance with the installation instructions and any applicable local, state, and national codes including, but not limited to building, electrical, and mechanical codes.

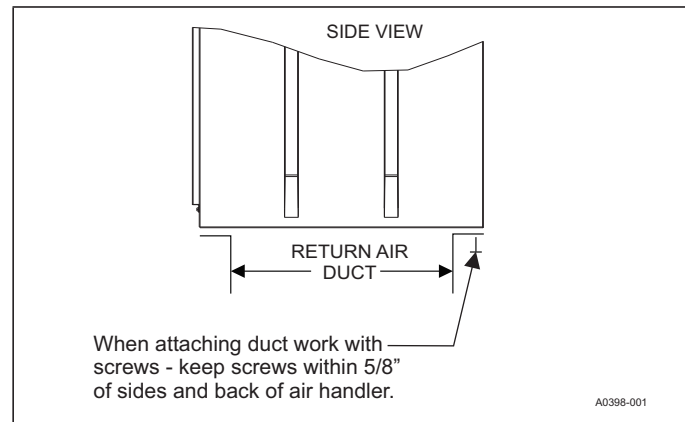
**SAFETY REQUIREMENTS**

1. Failure to carefully read and follow all instructions in this manual can result in air handler malfunction, death, personal injury and/or property damage.
2. This air handler should be installed in accordance with all national and local building/safety codes and requirements, local plumbing or wastewater codes, and other applicable codes.
3. This air handler should be installed only in a location and position specified in the "Unit Installation" section of this Instruction Manual.
4. The air handler is not to be used for temporary heating of buildings or structures under construction.
5. Always install the air handler to operate within the air handler's intended maximum outlet air temperature.
6. The unit rating plate displays the air handler model number. The unit dimensions for the supply air plenum are provided in Figure 5 and Table 1 of this Instruction Manual. The plenum must be installed according to the instructions. The return air duct attachment is shown in Figure 1.
7. Clearance from combustible material is provided under "Clearances" in the "Unit Installation" section.
8. It is necessary to maintain clearances for servicing. Access must be allowed for electric heaters and blower.
9. The unit rating plate and power supply must be verified to ensure that the electrical characteristics match.
10. Air handler shall be installed so the electrical components are protected from water.
11. Installing and servicing heating/cooling equipment can be hazardous due to the electrical components. Only trained and licensed personnel should install, repair, or service heating/cooling equipment. Unlicensed service personnel can perform basic maintenance functions such as cleaning and replacing the air filters. When working on heating/cooling equipment, the precautions in the manuals and on the labels attached to the unit and other safety precautions must be observed as applicable.

**⚠ CAUTION**

These air handlers should be transported & handled in an upright, upflow position. Failure to do so may result in unit damage and personal injury. Configuration conversions should be done at site of installation.

12. These instructions cover minimum requirements and conform to existing national standards and safety codes. In some instances these instructions exceed certain local codes and ordinances, especially those who have not kept up with changing residential and non-HUD modular home construction practices. These instructions are required as a minimum for a safe installation.

**FIGURE 1: Return Air Duct Attachment****INSPECTION**

As soon as a unit is received, it should be inspected for possible damage during transit. If damage is evident, the extent of the damage should be noted on the carrier's freight bill. A separate request for inspection by the carrier's agent should be made in writing. Also, before installation the unit should be checked for screws or bolts, which may have loosened in transit. There are no shipping or spacer brackets which need to be removed.

It should be verified that the appropriate coil and accessories (such as heater kit and thermostatic expansion valve kit) are available as required. Installation of these accessories or field conversion of the unit should be accomplished before setting the unit in place or connecting any wiring, duct work or piping.

**SECTION III: UNIT INSTALLATION****UNIT SIZING**

1. The size of the unit should be based on an acceptable heat loss or gain calculation for the structure. The ACCA – Manual J or other approved methods may be used. Reference Figure 5 and Table 1.
2. Only connect the air handler to a duct system which has an external static pressure within the allowable range.
3. Airflow must be within the minimum and maximum limits approved for electric heat, indoor coils and outdoor units.

Entering Air Temperature Limits			
Wet Bulb Temp. °F		Dry Bulb Temp. °F	
Min.	Max.	Min.	Max.
57	72	65	95

4. When an air handler is installed so that supply ducts carry air circulated by the air handler to areas outside the space containing the air handler, the return air shall also be handled by duct(s) sealed to the air handler casing and terminating in the space to be cooled/heated.
5. Refer to the unit rating plate for the air handler model number, and then see the dimensions page of this instruction for supply air plenum dimensions. The plenum must be installed according to the instructions.
6. The installer must check available supply power and verify that it is within the normal operating voltage range for the unit. The acceptable voltage range for these units is as follows:

Air Handler Voltage	Normal Operating <sup>1</sup> Voltage Range
208-230-1-60	187-253

1. Rated in accordance with ARI Standard 110, utilization range "A".

## CLEARANCES

Clearances must be taken into consideration, and provided for as follows:

1. Maintenance and servicing access - minimum 36" from front of unit recommended for blower motor / coil replacement.
2. The duct work connected to this unit is designed for zero clearance to combustible materials.
3. A combustible floor base accessory is available for downflow applications of this unit, if required by local code.

## LOCATION

Location is usually predetermined. Check with owner's or dealer's installation plans. If location has not been decided, consider the following in choosing a suitable location:

1. Select a location with adequate structural support, space for service access, and clearance for air return and supply duct connections.
2. Using hanging brackets to wall mount this single piece air handler unit is not recommended.
3. Normal operating sound levels may be objectionable if the air handler is placed directly over some rooms such as bedrooms, study, etc.
4. If using the air handler unit with an indoor coil, select a location that will permit installation of condensate line to open drain or outdoors allowing condensate to drain away from structure.

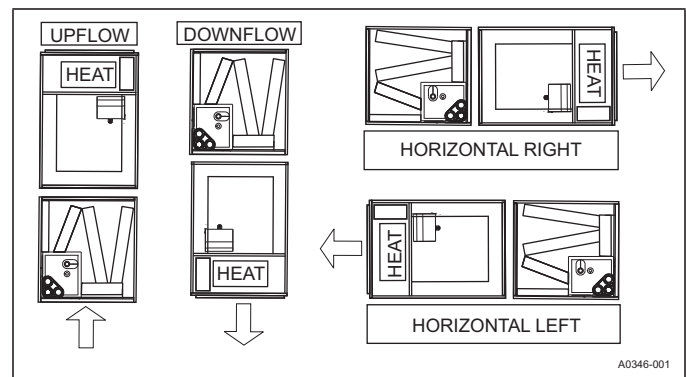
## NOTICE

*The primary and secondary drain line must be trapped to allow proper drainage of condensate water. The secondary drain line should be piped to a location that will give the occupant a visual warning that the primary drain is clogged. If the secondary drain line is not used, it must be capped.*

5. When an indoor coil is installed in an attic or above a finished ceiling, an auxiliary drain pan should be provided under the air handler as is specified by most local building codes.
6. Proper electrical supply must be available.
7. If unit is located in an area of high humidity (i.e. an unconditioned garage or attic), nuisance sweating of casing may occur. On these installations, unit duct connections and other openings should be properly sealed, and a wrap of 2" fiberglass insulation with vinyl vapor barrier should be used.

## AIR HANDLER CONFIGURATION

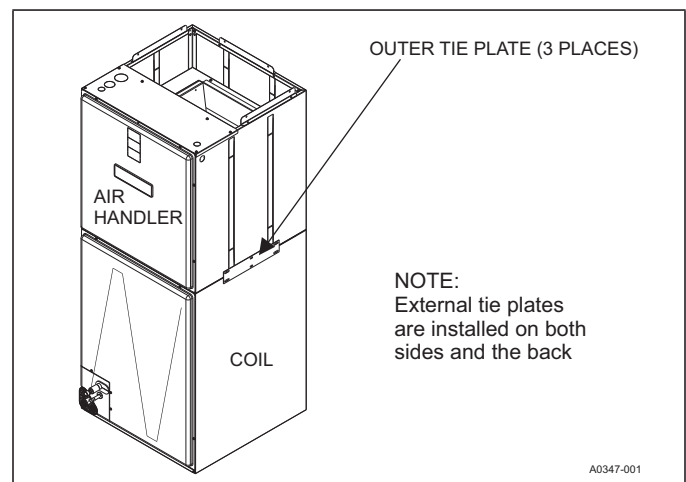
These air handler units are supplied ready to be installed in an upflow, downflow, horizontal right or horizontal left position. Refer to Figure 2. The unit requires no conversion procedures.



**FIGURE 2:** Typical Installation

## AIR HANDLER AND COIL UPFLOW, DOWNFLOW, AND HORIZONTAL POSITIONS

1. Apply neoprene gasket to the return air end of air handler.
2. Attach three tie plates to external sides and back of air handler casing using screws. Refer to Figure 3.
3. Position blower casing over appropriate coil opening (depending on configuration). Refer to Figure 2.
4. Attach the three tie plates to coil casing using screws. Refer to Figure 3.
5. Remove coil access panel.
6. Slide the coil out of the coil cabinet, and set coil to the side.
7. Locate 2" wide foam gasket.
8. Apply foam gasket over the air handler and coil mating seams on the interior of both unit sides and back. Refer to Figure 4.
9. Slide the coil into the housing, and install the coil access panel.



**FIGURE 3:** Coil and Air Handler Attachment Details



FIGURE 4: Gasket Location

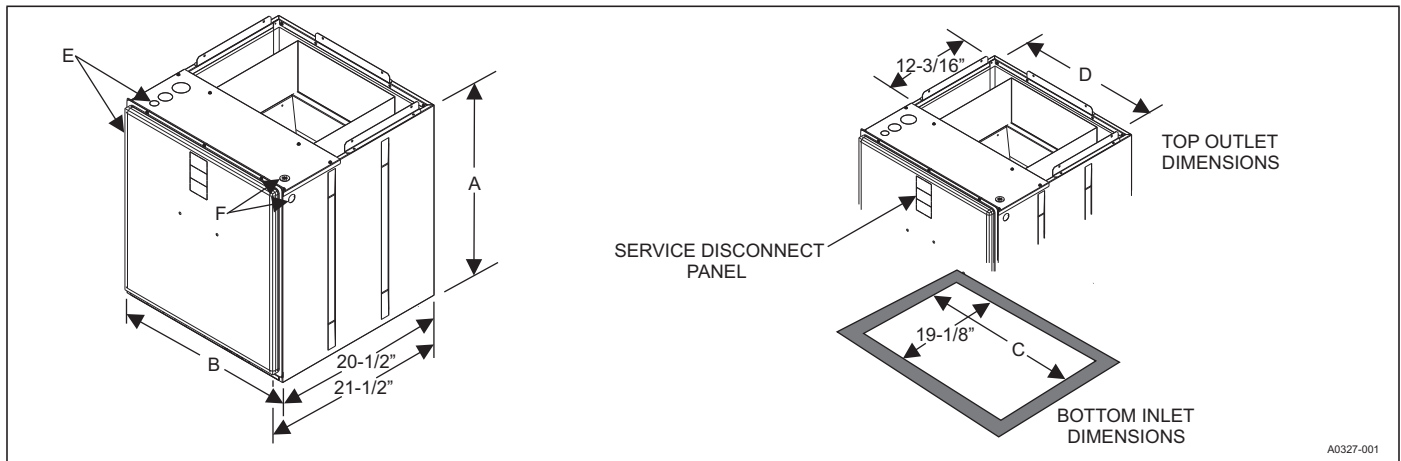


FIGURE 5: Dimensions & Duct Connection Dimensions

TABLE 1: Dimensions<sup>1</sup>

MP MODELS	Dimensions				Wiring Knockouts <sup>2</sup>	
	A	B	C	D	E	F
	Height	Width	Bottom Opening	Top Opening	Power	Control
08B	21-1/2	17-1/2	16-1/2	16-1/2	7/8 (1/2) 1-3/8 (1) 1-23/32 (1-1/4)	7/8 (1/2)
12B	21-1/2	17-1/2	16-1/2	16-1/2		
14D	22-1/2	24-1/2	23-1/2	23-1/2		
16C	22-1/2	21	20	20		
20D	22-1/2	24-1/2	23-1/2	23-1/2		

1. All dimensions are in inches.  
 2. Actual size (Conduit size).

## SECTION IV: DUCT WORK AND CONNECTIONS

### ⚠ WARNING

Use only 1/2" screws to connect duct work to bottom of unit.

Air supply and return may be handled in one of several ways best suited to the installation. Upflow, horizontal or downflow applications may be used.

The vast majority of problems encountered with heating and cooling systems can be linked to improperly designed or installed duct systems. It is therefore highly important to the success of an installation that the duct system be properly designed and installed.

When installing a central air return grille in or near the living space, it is advisable to design the duct work so that the grille is not in direct line with the opening in the unit. One or two elbows and acoustical duct liner assures a quieter system. Operation where return air duct is short or where sound may be a problem, acoustical duct liner should be used inside the duct. If electric heat is used, non-flammable material must be used.

Use flexible duct connectors to minimize the transmission of vibration/noise into the conditioned space. Never fasten duct work directly to the structure.

### ⚠ WARNING

Do not bring in return air from a location which could introduce hazardous substances into the airflow.

Use 1/2" screws to connect duct work to cabinet. If pilot holes are drilled, drill only through field duct and unit flange.

### ⚠ CAUTION

This unit is not designed for non-ducted (freeblow) applications. Do not operate without duct work attached to unit.

Equipment should never be operated without filters.

Insulation of duct work is a must where it runs through an unheated space during the heating season or through an uncooled space during the cooling season. The use of a vapor barrier is recommended to prevent absorption of moisture from the surrounding air into the insulation.

The supply air duct should be properly sized by use of a transition to match unit opening. All ducts should be suspended using flexible hangers and never fastened directly to the structure.

Duct work should be fabricated and installed in accordance with local and/or national codes. This includes the standards of the National Fire Protection Association for Installation of Air-Conditioning and Ventilating Systems, NFPA No. 90B. Duct systems should be designed in accordance with the Air Conditioning Contractors of America (ACCA) – Manual D.

## HORIZONTAL SUSPENSION

For suspension of these units in horizontal applications, it is recommended to use angle steel support brackets with threaded rods, supporting the units from the bottom, at the locations shown in Figure 6.

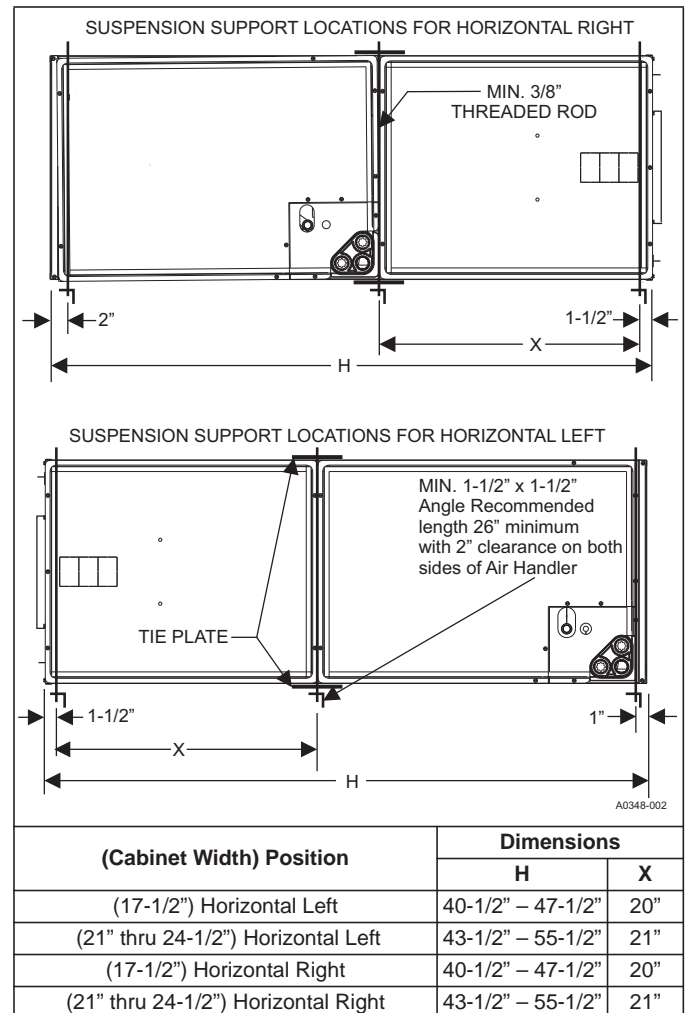


FIGURE 6: Typical Horizontal Installation



### DUCT FLANGES

Three duct flanges are provided to assist in positioning and attaching duct work to the air handler. These flanges are included in the unit parts bag. With the screws from the parts bag, install one of the duct flanges. Duct flanges have holes on both legs with one leg longer than the other. The longer leg can be used to mate against the air handler so that different thicknesses of duct board can be made flush with the outer surface of the air handler. Repeat the procedure for the other two flanges. Refer to Figure 7. If the flanges are not used, they may be discarded.

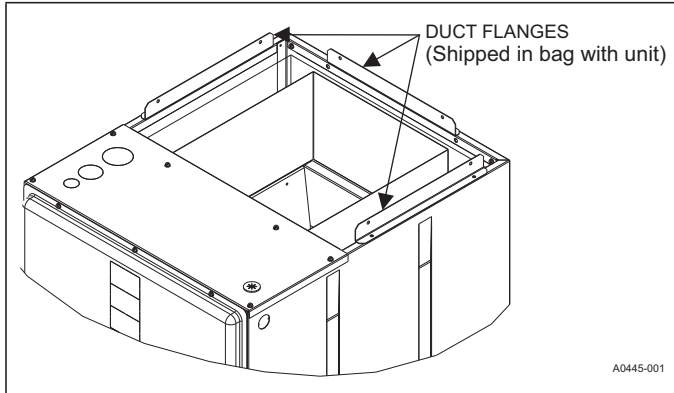


FIGURE 7: Duct Attachment

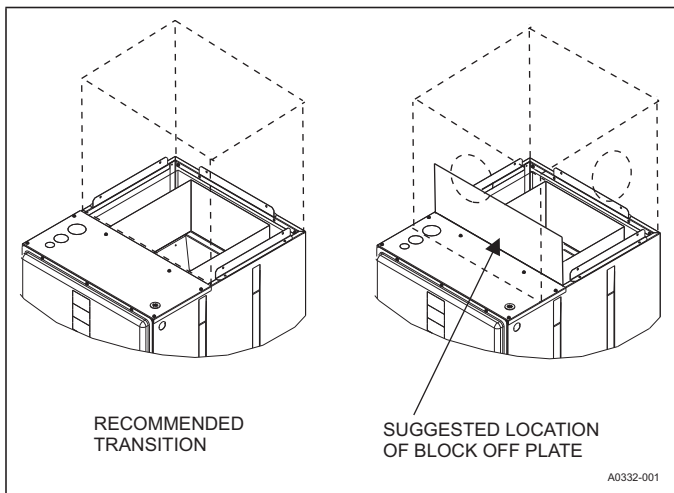


FIGURE 8: Duct Work Transition

### UNIT CONNECTIONS

There are several ways to handle the supply and return air duct connections. The location and sizing of the connections depends on the situation and the method best suited to the installation. Upflow, horizontal or downflow applications may be used.

The supply air duct should be properly sized by use of a transition to match unit opening. Refer to Table 1 for air handler unit inlet and outlet dimensions.

**⚠ CAUTION**

*Use 1/2" screws to connect duct work to unit. Longer screws will pierce the drain pan and cause leakage. If pilot holes are drilled, drill only through field duct and unit bottom duct flange.*

Duct work that is not designed to match the supply air opening can cause turbulence inside the plenum. This turbulence can change the air flow patterns across the electric heater limit switches. If the factory suggested transition cannot be fabricated, it is recommended that a block off plate (approximately 8" high and running the full width of the plenum) be attached to the supply opening. Refer to Figure 8 as a visual aid. The use of this block off plate will enable better air circulation across the limit switches.

### AIR FILTERS

Return air filters are required and must be field supplied. Filtration must be accomplished external to the unit.

**⚠ CAUTION**

*Equipment should never be operated without filters.*

## SECTION V: ELECTRIC HEATER INSTALLATION

If the air handler requires electric heat, install the electric heat kit according to the installation instructions included with the kit. After installing the kit, mark the air handler nameplate to designate the heater kit that was installed. If no heater is installed, mark the name plate appropriately to indicate that no heat kit is installed.

Use only 6HK Revision C or later heater kits, as listed on air handler name plate and in these instructions. Use data from Tables 4 through 10 for information on required minimum motor speed tap to be used for heating operation, maximum over-current protection device required as listed for combination of air handler and heater kit.

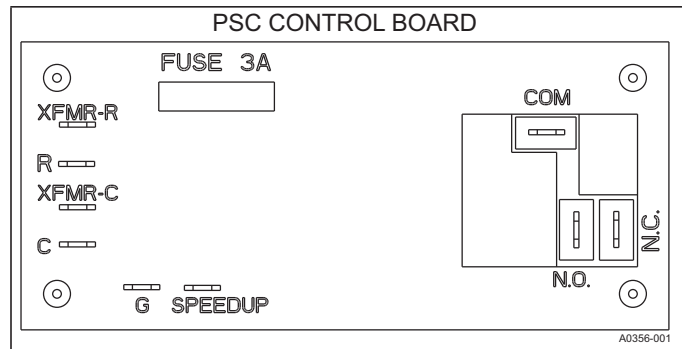


FIGURE 9: Blower Delay Control Board

## SECTION VI: LINE POWER CONNECTIONS

Power may be brought into the unit through the supply air end of the unit (top left when unit is vertical) or the left side panel. Use the hole appropriate to the unit's orientation in each installation to bring conduit from the disconnect. The power lead conduit should be terminated at the electrical control box. Refer to Tables 3, 7-10 to determine proper wire sizing. Refer to the latest edition of the National Electric Code or in Canada the Canadian electrical Code and local codes to determine correct wire sizing. To minimize air leakage, seal the wiring entry point at the outside of the unit.

All electrical connections to air handlers must be made with copper conductors. **Direct connection of aluminum wiring to air handlers is not approved.**

If aluminum conductors are present, all applicable local and national codes must be followed when converting from aluminum to copper conductors prior to connection to the air handler.

The chosen conductor and connections all must meet or exceed the amperage rating of the overcurrent protector (service disconnect or fuse) in the circuit.

Additionally, existing aluminum wire within the structure must be sized correctly for the application according to National Electric Code and local codes. Caution must be used when sizing aluminum rather than copper conductors, as aluminum conductors are rated for less current than copper conductors of the same size.

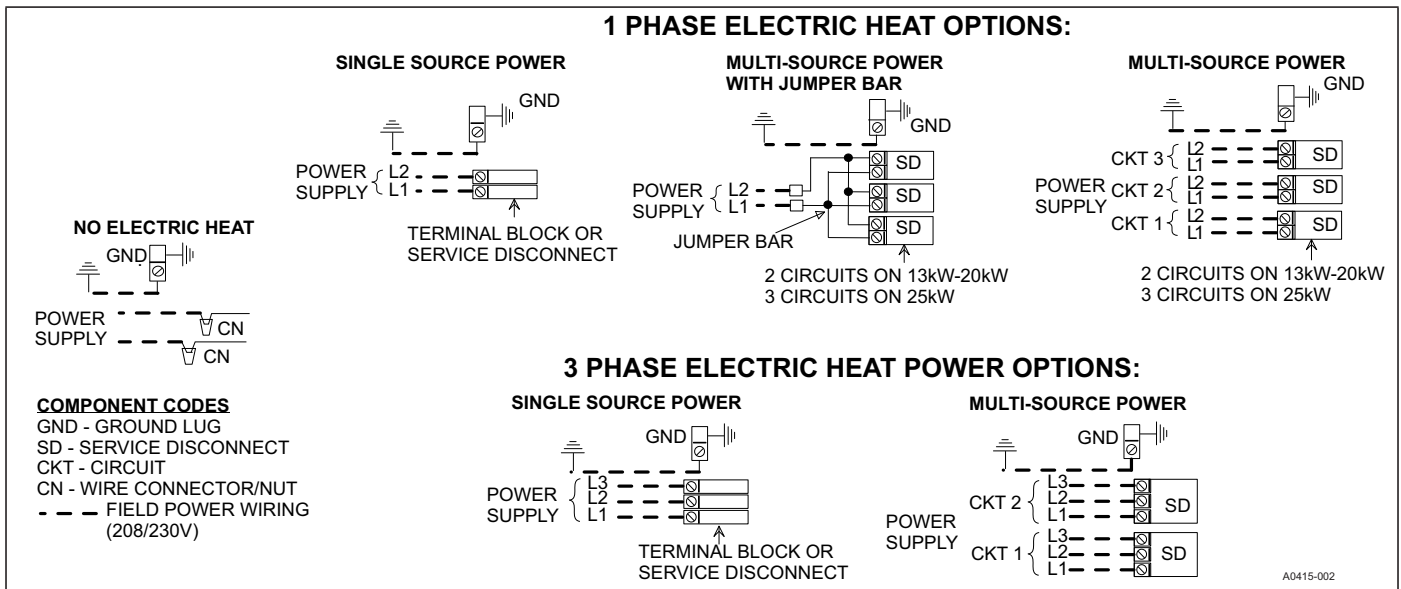


FIGURE 10: Line Power Connections

## SECTION VII: LOW VOLTAGE CONTROL CONNECTIONS

The 24 volt power supply is provided by an internally wired low voltage transformer which is standard on all models. If the unit is connected to a 208 volt power supply, the low voltage transformer must be rewired to the 208 volt tap. See the unit wiring diagram.

Field supplied low voltage wiring can exit the unit through the top right (when unit is vertical upflow) or the right side panel. Refer to Figure 5.

Remove desired knockout and pierce foil faced insulation to allow wiring to pass through. Use as small of a hole as possible to minimize air leakage. Install a 7/8" plastic bushing in the selected hole and keep low voltage wiring as short as possible inside the control box.

To further minimize air leakage, seal the wiring entry point at the outside of the unit.

The field wiring is to be connected at the pigtails supplied with the air handler. Refer to Figures 12 and 13 for system wiring.

**NOTICE**

All wiring must comply with local and national electrical code requirements. Read and heed all unit caution labels.

**NOTICE**

It is possible to vary the amount of electric heat turned on during the defrost cycle of a heat pump. Standard wiring will only bring on the first stage of electric heat during defrost. See Table 6 for additional information on heat during defrost cycle.

## SECTION VIII: BLOWER SPEED CONNECTIONS

Adjust blower motor speed to provide airflow within the minimum and maximum limits approved for indoor coil, electric heat and outdoor unit. Speed tap adjustments are made at the motor terminal block. Airflow data is shown in Tables 11-12.

Connect motor wires to motor speed tap receptacle for speed desired. See unit wiring label for motor wiring details.

Blower Speed Connections

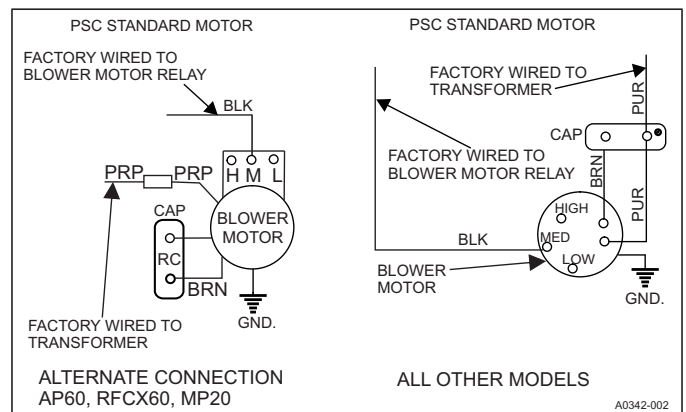


FIGURE 11: Blower Speed Connections

## SECTION IX: UNIT DATA

**TABLE 2:** Physical and Electrical Data - Cooling Only

Models		MP08B	MP12B	MP14D	MP16C	MP20D
Blower - Diameter x Width		10 x 8	10 x 8	10 x 10	10 x 10	10 x 10
Motor	HP	1/4 HP	1/2 HP	1/2 HP	1/2 HP	1 HP
	Nominal RPM	850	1085	1085	1040	1007
Voltage		208/230	208/230	208/230	208/230	208/230
Full Load Amps @230V		1.4	2.6	2.8	2.9	4.1
Filter <sup>1</sup>	Type	DISPOSABLE OR PERMANENT				
	Size	16 x 20 x 1	16 x 20 x 1	22 x 20 x 1	20 x 20 x 1	22 x 20 x 1
	Bottom Rack Kit	1BR01117	1BR01117	1BR01124	1BR01121	1BR01124
	Permanent Type Kit	1PF0601	1PF0601	1PF0603	1PF0602	1PF0603
Shipping / Operating Weight (lbs.)		52/51	52/51	75/74	68/67	75/74

1. Field supplied.

**TABLE 3:** Electrical Data - Cooling Only

Models	Motor FLA <sup>1</sup>	Minimum Circuit Ampacity	MOP <sup>2</sup>
MP08B	1.4	1.8	15
MP12B	2.6	3.3	15
MP14D	2.8	3.5	15
MP16C	2.9	3.6	15
MP20D	4.1	5.1	15

1. FLA = Full Load Amps

2. MOP = Maximum Overcurrent Protection device; must be HACR type service disconnect or time delay fuse. Refer to the latest edition of the National Electric Code or in Canada the Canadian electrical Code and local codes to determine correct wire sizing.

**TABLE 4:** Electrical Heat: - Minimum Fan Speed

Heater Kit Models <sup>1,2,3</sup>	Nom. kW @240V	Air Handler Models				
		MP08B	MP12B	MP14D	MP16C	MP20D
6HK(0,1)6500206	2.4kW	Low	Low	Low	Low	Low
6HK(0,1)6500506	4.8kW	Low	Low	Low	Low	Low
6HK(0,1)6500806	7.7kW	Low	Low	Low	Low	Low
6HK(0,1)6501006 6HK36501025	9.6kW	Low	Low	Low	Low	Low
6HK(1,2)6501306	12.5kW	Med	Low	Low	Low	Low
6HK(1,2)6501506 6HK36501525	14.4kW	–	Med	Low	Low	Low
6HK(1,2)6501806 6HK36501825	17.3kW	–	Med	Low	Low	Low
6HK(1,2)6502006 6HK46502025	19.2kW	–	Med	Med	High	Low

1. (0,1) - 0 = no service disconnect OR 1 = with service disconnect.

2. (1,2) - 1 = with service disconnect, no breaker jumper bar OR 2 = with service disconnect & breaker jumper bar.

3. 6HK3 = 3-Phase with terminal block connectors only, 6HK4 = 3-Phase with service disconnect.

**TABLE 5:** KW & MBH Conversions - For Total Power Input Requirement

For a power distribution voltage that is different than the provided nominal voltage, multiply the kW and MBH data from the table by the conversion factor in the following table.

DISTRIBUTION POWER	NOMINAL VOLTAGE	CONVERSION FACTOR
208V	240V	0.75
220V	240V	0.84
230V	240V	0.92



**TABLE 6:** Electric Heat Performance Data: 208/230-1-60 & 208/230-3-60

	Heater Models <sup>1,2,3</sup>	Nominal kW @240V	Total Heat <sup>4</sup>				kW Staging			
			kW		MBH		W1 Only		W1 + W2	
			208V	230V	208V	230V	208V	230V	208V	230V
1PH	6HK(0,1)6500206	2.4	1.8	2.2	6.2	7.5	1.8	2.2	1.8	2.2
	6HK(0,1)6500506	4.8	3.6	4.4	12.3	15	3.6	4.4	3.6	4.4
	6HK(0,1)6500806	7.7	5.8	7.1	19.7	24.1	5.8	7.1	5.8	7.1
	6HK(0,1)6501006	9.6	7.2	8.8	24.6	30.1	7.2	8.8	7.2	8.8
	6HK(1,2)6501306	12.5	9.4	11.5	32	39.2	3.1	3.8	9.4	11.5
	6HK(1,2)6501506	14.4	10.8	13.2	36.9	45.1	3.6	4.4	10.8	13.2
	6HK(1,2)6501806	17.3	13	15.9	44.3	54.2	6.5	7.9	13	15.9
	6HK(1,2)6502006	19.2	14.4	17.6	49.2	60.2	7.2	8.8	14.4	17.6
3PH	6HK36501025	9.6	7.2	8.8	24.6	30.1	7.2	8.8	7.2	8.8
	6HK36501525	14.4	10.8	13.2	36.9	45.1	10.8	13.2	10.8	13.2
	6HK36501825	17.3	13	15.9	44.3	54.2	13	15.9	13	15.9
	6HK46502025	19.2	14.4	17.6	49.2	60.2	7.2	8.8	14.4	17.6

- (0,1) - 0 = no service disconnect OR 1 = with service disconnect.
- (1,2) - 1 = with service disconnect, no breaker jumper bar OR 2 = with service disconnect & breaker jumper bar.
- 6HK3 = 3-Phase with terminal block connectors only, 6HK4 = 3-Phase with service disconnect.
- For different power distributions, see conversion table on Page 9.

**TABLE 7:** Electrical Data For Single Source Power Supply: 208/230-1-60

Air Handler Models	Heater Models <sup>1,2</sup>	Heater Amps @240V	Field Wiring			
			Min. Circuit Ampacity		MOP. <sup>3</sup>	
			208V	230V	208V	230V
MP08B	6HK(0,1)6500206	10	12.6	13.7	15	15
	6HK(0,1)6500506	20	23.4	25.7	25	30
	6HK(0,1)6500806	32	36.6	40.3	40	45
	6HK(0,1)6501006	40	45.0	49.6	45	50
	6HK(1,2)6501306	52	58.2	64.3	60	70
MP12B	6HK(0,1)6500206	10	14.1	15.2	15	20
	6HK(0,1)6500506	20	24.9	27.2	25	30
	6HK(0,1)6500806	32	38.1	41.8	40	45
	6HK(0,1)6501006	40	46.5	51.1	50	60
	6HK(1,2)6501306	52	59.7	65.8	60	70
	6HK(1,2)6501506	60	68.2	75.0	70	80
	6HK(1,2)6501806	72	81.4	89.7	90	90
	6HK(1,2)6502006	80	89.8	98.9	90	100
MP14D	6HK(0,1)6500206	10	14.3	15.5	15	20
	6HK(0,1)6500506	20	25.1	27.4	30	30
	6HK(0,1)6500806	32	38.4	42.1	40	45
	6HK(0,1)6501006	40	46.8	51.3	50	60
	6HK(1,2)6501306	52	60.0	66.0	60	70
	6HK(1,2)6501506	60	68.4	75.2	70	80
	6HK(1,2)6501806	72	81.6	89.9	90	90
	6HK(1,2)6502006	80	90.0	99.2	90	100
MP16C	6HK(0,1)6500206	10	14.4	15.6	15	20
	6HK(0,1)6500506	20	25.3	27.5	30	30
	6HK(0,1)6500806	32	38.5	42.2	40	45
	6HK(0,1)6501006	40	46.9	51.5	50	60
	6HK(1,2)6501306	52	60.1	66.1	70	70
	6HK(1,2)6501506	60	68.5	75.4	70	80
	6HK(1,2)6501806	72	81.8	90.0	90	90
	6HK(1,2)6502006	80	90.2	99.3	90	100

For notes, see Page 10.

**TABLE 7:** Electrical Data For Single Source Power Supply: 208/230-1-60 (Continued)

Air Handler Models	Heater Models <sup>1,2</sup>	Heater Amps @240V	Field Wiring			
			Min. Circuit Ampacity		MOP. <sup>3</sup>	
			208V	230V	208V	230V
MP20D	6HK(0,1)6500206	10	15.9	17.1	20	20
	6HK(0,1)6500506	20	26.8	29.0	30	30
	6HK(0,1)6500806	32	40.0	43.7	40	45
	6HK(0,1)6501006	40	48.4	53.0	50	60
	6HK(1,2)6501306	52	61.6	67.6	70	70
	6HK(1,2)6501506	60	70.0	76.9	70	80
	6HK(1,2)6501806	72	83.3	91.5	90	100
	6HK(1,2)6502006	80	91.7	100.8	100	110

1. (0,1) - maybe 0 (no service disconnect) or 1 (with service disconnect).

2. (1,2) maybe 1 (with service disconnect, no breaker jumper bar) or 2 (with service disconnect & breaker jumper bar).

3. MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse. Refer to the latest edition of the National Electric Code or in Canada the Canadian electrical Code and local codes to determine correct wire sizing.

**TABLE 8:** Electrical Data For Multi-source Power Supply: 208/230-1-60

Air Handlers Models	Heater Models	Total Heater Amps @240V	Min. Circuit Ampacity				MOP <sup>1</sup>			
			208V		230V		208V		230V	
			Circuit				Circuit			
			1st <sup>3</sup>	2nd	1st <sup>3</sup>	2nd	1st <sup>3</sup>	2nd	1st <sup>3</sup>	2nd
MP08B	6HK16501306	52	20.5	37.6	22.5	41.5	25	40	25	45
MP12B	6HK16501306	52	22	37.6	24	41.5	25	40	25	45
	6HK16501506	60	24.9	43.3	27.2	47.9	25	45	30	50
	6HK16501806	72	42.3	39	46.4	43.1	45	40	50	45
	6HK16502006	80	46.6	43.3	51.2	47.9	50	45	60	50
MP14D	6HK16501306	52	22.3	37.6	24.3	41.5	25	40	25	45
	6HK16501506	60	25.2	43.3	27.5	47.9	30	45	30	50
	6HK16501806	72	29.5	39	46.6	43.1	30	40	50	45
	6HK16502006	80	32.4	43.3	51.4	47.9	35	45	60	50
MP16C	6HK16501306	52	22.4	37.6	24.4	41.5	25	40	25	45
	6HK16501506	60	25.3	43.3	27.6	47.9	30	45	30	50
	6HK16501806	72	42.6	39	46.8	43.1	30	40	50	45
	6HK16502006	80	47.0	43.3	51.5	47.9	35	45	60	50
MP20D	6HK16501306	52	23.9	37.6	25.9	41.5	25	40	30	45
	6HK16501506	60	26.8	43.3	29.1	47.9	30	45	30	50
	6HK16501806	72	44.1	39	48.3	43.1	45	40	50	45
	6HK16502006	80	48.5	43.3	53	47.9	50	45	60	50

1. MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse. The 1st Circuit includes the blower motor amps. Refer to the latest edition of the National Electric Code or in Canada the Canadian electrical Code and local codes to determine correct wire sizing.

**TABLE 9:** Electrical Data For Single Source Power Supply: 208/230-3-60

Air Handler Models	Heater Models <sup>1</sup>	Heater Amps @240V	Field Wiring			
			Min. Circuit Ampacity <sup>2</sup>		MOP	
			208V	230V	208V	230V
MP08B	6HK36501025	23.1	26.8	29.4	30	30
MP12B	6HK36501025	23.1	28.3	30.9	30	35
	6HK36501525	34.6	40.8	44.7	45	45
	6HK36501825	41.6	48.4	53.2	50	55
	6HK46502025 <sup>3</sup>	46.2	53.3	58.5	55	60
MP14D	6HK36501025	23.1	28.5	31.1	30	35
	6HK36501525	34.6	41.0	45.0	45	45
	6HK36501825	41.6	48.7	53.4	50	55
	6HK46502025 <sup>3</sup>	46.2	53.5	58.8	55	60
MP16C	6HK36501025	23.1	28.6	31.3	30	35
	6HK36501525	34.6	41.1	45.1	45	50
	6HK36501825	41.6	48.8	53.6	50	55
	6HK46502025 <sup>3</sup>	46.2	53.6	58.9	55	60
MP20D	6HK36501025	23.1	30.1	32.8	35	35
	6HK36501525	34.6	42.6	46.6	45	50
	6HK36501825	41.6	50.3	55.1	55	60
	6HK46502025 <sup>3</sup>	46.2	55.1	60.4	60	70

1. 6HK3 = 3-Phase with terminal block connections only, 6HK4 = 3-Phase with service disconnect.
2. The 20kW and 25kW heater models (6HK46502025 and 6HK46502525) come with service disconnects standard. Single source power MCA and MOP requirements are given here only for reference if used with field installed single point power modification (S1-32436041000).
3. MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse. The 1st circuit includes blower motor amps. Refer to the latest edition of the National Electric Code or in Canada the Canadian electrical Code and local codes to determine correct wire sizing.

**TABLE 10:** Electrical Data For Multi-source Power Supply: 208/230-3-60

Air Handler Models	Heater Models <sup>1</sup>	Heater Amps @240V	Min. Circuit Ampacity				MOP <sup>2</sup>			
			208V		230V		208V		230V	
			Circuit				Circuit			
			1st	2nd	1st <sup>3</sup>	2nd	1st <sup>3</sup>	2nd	1st <sup>3</sup>	2nd
MP12B	6HK46502025	46.2	28.3	25.0	30.9	27.6	30	25	35	30
MP14D	6HK46502025	46.2	28.5	25.0	31.1	27.6	30	25	35	30
MP16C	6HK46502025	46.2	28.6	25.0	31.3	27.6	30	25	35	30
MP20D	6HK46502025	46.2	30.1	25.0	32.8	27.6	35	25	35	30

1. The 20kW heater model (6HK46502025) come with service disconnects standard.
2. MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse. The 1st circuit includes blower motor amps. Refer to the latest edition of the National Electric Code or in Canada the Canadian electrical Code and local codes to determine correct wire sizing.

**TABLE 11:** Air Flow Data (CFM)<sup>1</sup>- 208Volt

MP Models	CM Models	Blower Motor Speed	External Static Pressure (in. wc.)						
			0.10	0.20	0.30	0.40	0.50	0.60	0.70
<b>208 Volt</b>									
MP08B	CM18B	High	975	965	953	926	889	772	724
		Medium	729	719	700	643	614	540	354
		Low	576	561	501	455	407	289	209
	CM24B	High	950	944	927	907	876	838	742
		Medium	713	703	686	656	591	533	478
		Low	560	546	511	448	398	294	208
MP12B	CM30B	High	1459	1410	1342	1275	1200	1129	1022
		Medium	1241	1210	1156	1110	1044	1002	917
		Low	992	965	940	911	867	822	758
	CM36B	High	1487	1438	1383	1315	1245	1150	1073
		Medium	1226	1202	1166	1119	1079	1007	945
		Low	959	950	925	892	866	818	716
MP14D	CM30D	High	1944	1891	1832	1767	1693	1594	1303
		Medium	1518	1494	1470	1425	1377	1186	1071
		Low	1208	1198	1180	1155	1019	968	830
	CM36D	High	1967	1920	1848	1781	1710	1623	1532
		Medium	1520	1508	1486	1446	1398	1203	1101
		Low	1207	1202	1176	1156	1028	970	885
	CM42D	High	1949	1912	1854	1791	1715	1645	1358
		Medium	1538	1521	1492	1458	1406	1265	1144
		Low	1197	1190	1179	1128	1052	998	903
MP16C	CM36C	High	1776	1709	1646	1573	1491	1328	1171
		Medium	1591	1545	1486	1424	1300	1173	1066
		Low	1360	1331	1285	1194	1097	1027	941
	CM42C	High	1746	1687	1616	1536	1386	1265	1147
		Medium	1564	1507	1451	1388	1246	1148	998
		Low	1339	1301	1258	1136	1052	994	876
	CM48C	High	1817	1756	1678	1599	1511	1296	1120
		Medium	1673	1618	1542	1477	1349	1138	915
		Low	1448	1419	1362	1281	1136	1001	948
MP20D	CM42D	High	2035	1994	1922	1858	1781	1658	1562
		Medium	1849	1819	1771	1694	1650	1575	1364
		Low	1679	1654	1624	1578	1526	1339	1263
	CM48D	High	2061	2001	1937	1871	1780	1684	1570
		Medium	1867	1835	1786	1727	1653	1563	1328
		Low	1678	1657	1615	1572	1518	1441	1235
	CM60D	High	2021	1979	1897	1833	1751	1668	1521
		Medium	1852	1811	1758	1697	1639	1547	1389
		Low	1646	1630	1596	1555	1491	1384	1247
	CM64D	High	1867	1832	1784	1729	1652	1572	1462
		Medium	1498	1484	1443	1411	1361	1233	1138
		Low	1128	1122	1115	1096	1020	967	893

1. Air handler units have been tested to UL 1995 / CSA 22.2 No. 236 standards up to 0.50" wc. external static pressure.

Dry coil conditions only, tested without filters.

For optimal performance, external static pressures of 0.2" to 0.5" are recommended. Heating applications tested at 0.50" w.c. esp.

**TABLE 12: Air Flow Data (CFM)<sup>1</sup> - 230 Volt**

MP Models	CM Models	Blower Motor Speed	External Static Pressure (in. wc.)						
			0.10	0.20	0.30	0.40	0.50	0.60	0.70
<b>230 Volts</b>									
MP08B	CM18B	High	1142	1126	1093	1057	1009	953	852
		Medium	855	840	826	798	756	696	594
		Low	676	663	638	584	528	482	404
	CM24B	High	1105	1088	1060	1030	987	948	859
		Medium	825	815	802	780	752	678	591
		Low	655	636	616	569	504	467	345
MP12B	CM30B	High	1521	1471	1397	1322	1241	1161	1057
		Medium	1369	1329	1281	1224	1166	1092	1015
		Low	1130	1107	1071	1029	972	910	842
	CM36B	High	1557	1507	1440	1363	1289	1185	1125
		Medium	1351	1321	1266	1207	1153	1076	1019
		Low	1103	1083	1056	1024	976	928	851
MP14D	CM30D	High	2092	2038	1958	1884	1795	1714	1591
		Medium	1725	1697	1634	1598	1534	1454	1179
		Low	1374	1366	1339	1316	1250	1070	904
	CM36D	High	2099	2040	1980	1903	1814	1680	1605
		Medium	1725	1694	1652	1605	1541	1467	1182
		Low	1388	1372	1340	1306	1277	1106	1026
	CM42D	High	2083	2033	1960	1894	1820	1720	1459
		Medium	1690	1662	1623	1587	1534	1460	1233
		Low	1399	1393	1370	1338	1269	1159	1073
MP16C	CM36C	High	1850	1785	1705	1625	1541	1373	1242
		Medium	1693	1642	1574	1499	1378	1261	1145
		Low	1512	1465	1407	1324	1225	1101	1022
	CM42C	High	1815	1754	1680	1593	1472	1278	1206
		Medium	1670	1613	1554	1473	1311	1210	1082
		Low	1488	1445	1376	1259	1181	1056	979
	CM48C	High	1886	1818	1739	1646	1567	1348	1163
		Medium	1742	1683	1622	1538	1461	1237	1121
		Low	1563	1512	1455	1399	1234	1086	1019
MP20D	CM42D	High	2123	2076	2001	1926	1840	1744	1439
		Medium	1999	1959	1896	1821	1744	1651	1347
		Low	1851	1819	1768	1698	1626	1544	1269
	CM48D	High	2178	2107	2034	1953	1878	1775	1604
		Medium	2014	1965	1905	1843	1761	1660	1351
		Low	1867	1832	1779	1727	1661	1544	1280
	CM60D	High	2132	2052	1993	1899	1813	1733	1594
		Medium	1985	1941	1872	1798	1729	1648	1507
		Low	1848	1810	1758	1695	1627	1548	1355
	CM64D	High	2069	2011	1929	1848	1755	1651	1402
		Medium	1962	1902	1832	1758	1675	1558	1335
		Low	1833	1787	1734	1667	1581	1382	1269

1. Air handler units have been tested to UL 1995 / CSA 22.2 No. 236 standards up to 0.50" wc. external static pressure. Dry coil conditions only, tested without filters.  
For optimal performance, external static pressures of 0.2" to 0.5" are recommended. Heating applications tested at 0.50" w.c. esp.

## SECTION X: MAINTENANCE

Filters must be cleaned or replaced when they become dirty. Inspect at least once per month. The frequency of cleaning depends upon the hours of operation and the local atmospheric conditions. Clean filters keep unit efficiency high.

### COIL CLEANING

If the coil needs to be cleaned, it should be cleaned with water.

### LUBRICATION

The bearings of the blower motor are permanently lubricated.

### CONDENSATE DRAINS

During the cooling season check the condensate drain lines to be sure that condensate is flowing from the primary drain but not from the secondary drain. If condensate ever flows from the secondary drain the unit should be promptly shut off and the condensate pan and drains cleaned to insure a free flowing primary drain.

## SECTION XI: AIR SYSTEM ADJUSTMENT

To check the Cubic Feet per Minute (CFM), measure the static pressure drop across the air handler using a manometer and static pressure tips. To prepare coil for static pressure drop measurements run the fan only to assure a dry coil.

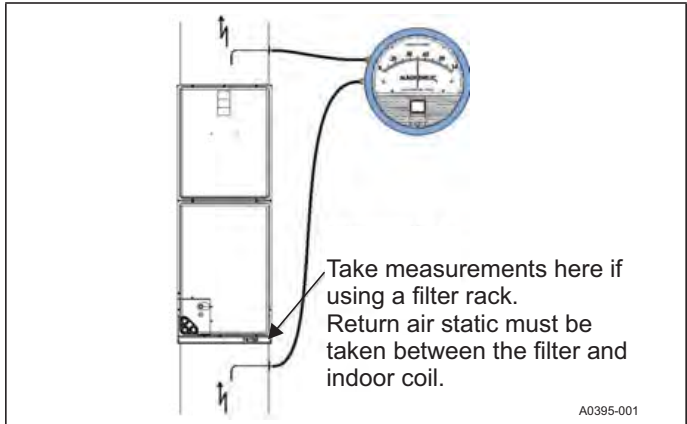
## NOTICE

Refer to Tables 11 & 12 for coil Air Flow Data of Cubic Feet Per Minute (CFM). Run the fan on the highest speed to be used.

Drill 2 holes, one 12" away from the air handler in the supply air duct and on 12" away from the air handler in the return air duct (before any elbows in the duct work). Insert the pressure tips and read the pressure drop from the manometer. See Tables 11 & 12 to determine the air flow, and make the necessary adjustments to keep the CFM within the airflow limitations of the coil.

### EXTERNAL DUCT STATIC

Measure the supply air static pressure. Record this positive number. Measure the return air static pressure. Record this negative number. Treat the negative number as a positive, and add the two numbers together. This is total system static. If a filter rack is installed on the return air end of the air handler or indoor coil section, the return air duct static must be measured between the filter and the indoor coil.



## SECTION XII: TYPICAL THERMOSTAT CONNECTIONS

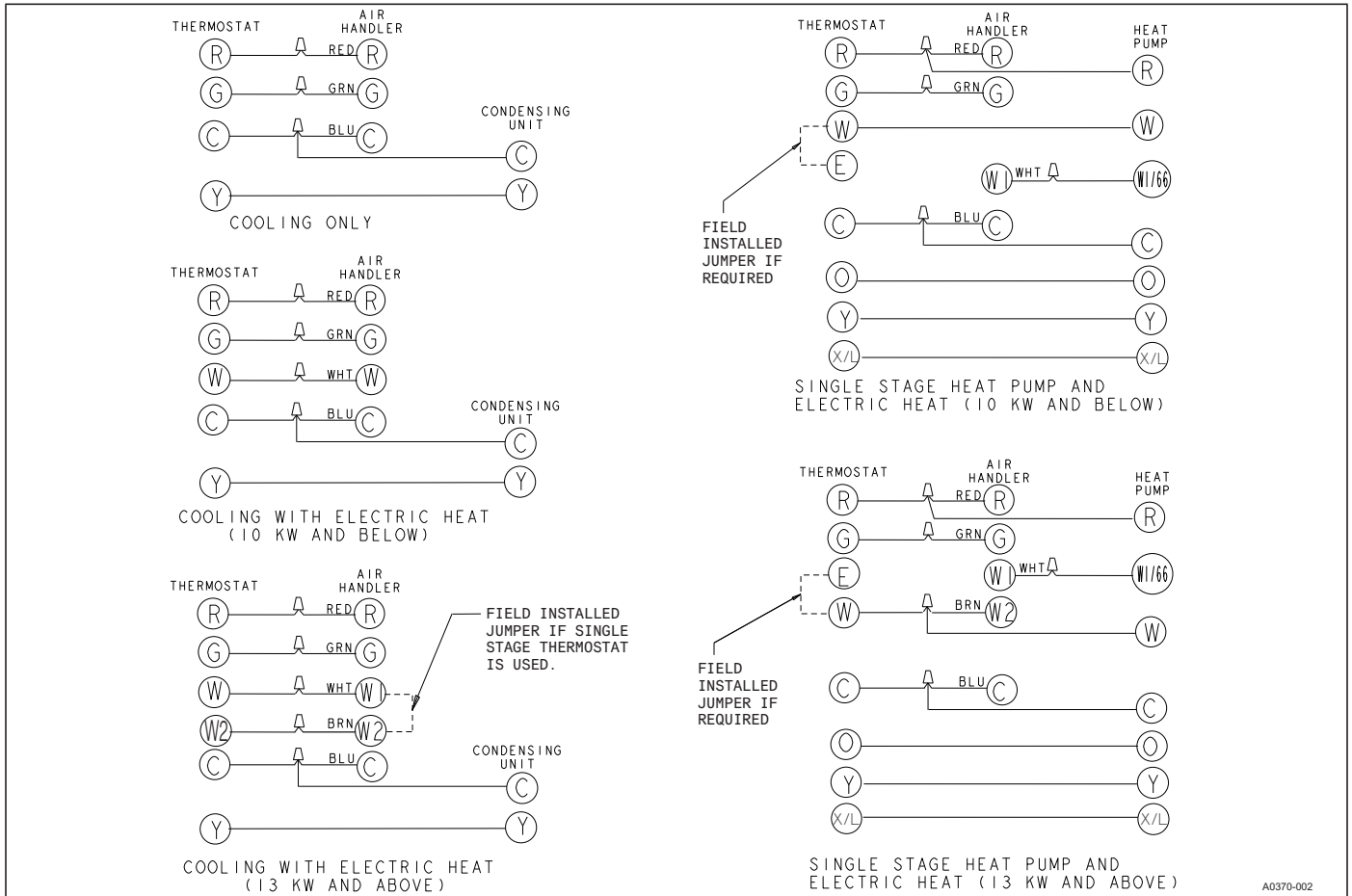


FIGURE 12: Typical Thermostat Wiring Diagram - ECM



SECTION XIII: WIRING DIAGRAM

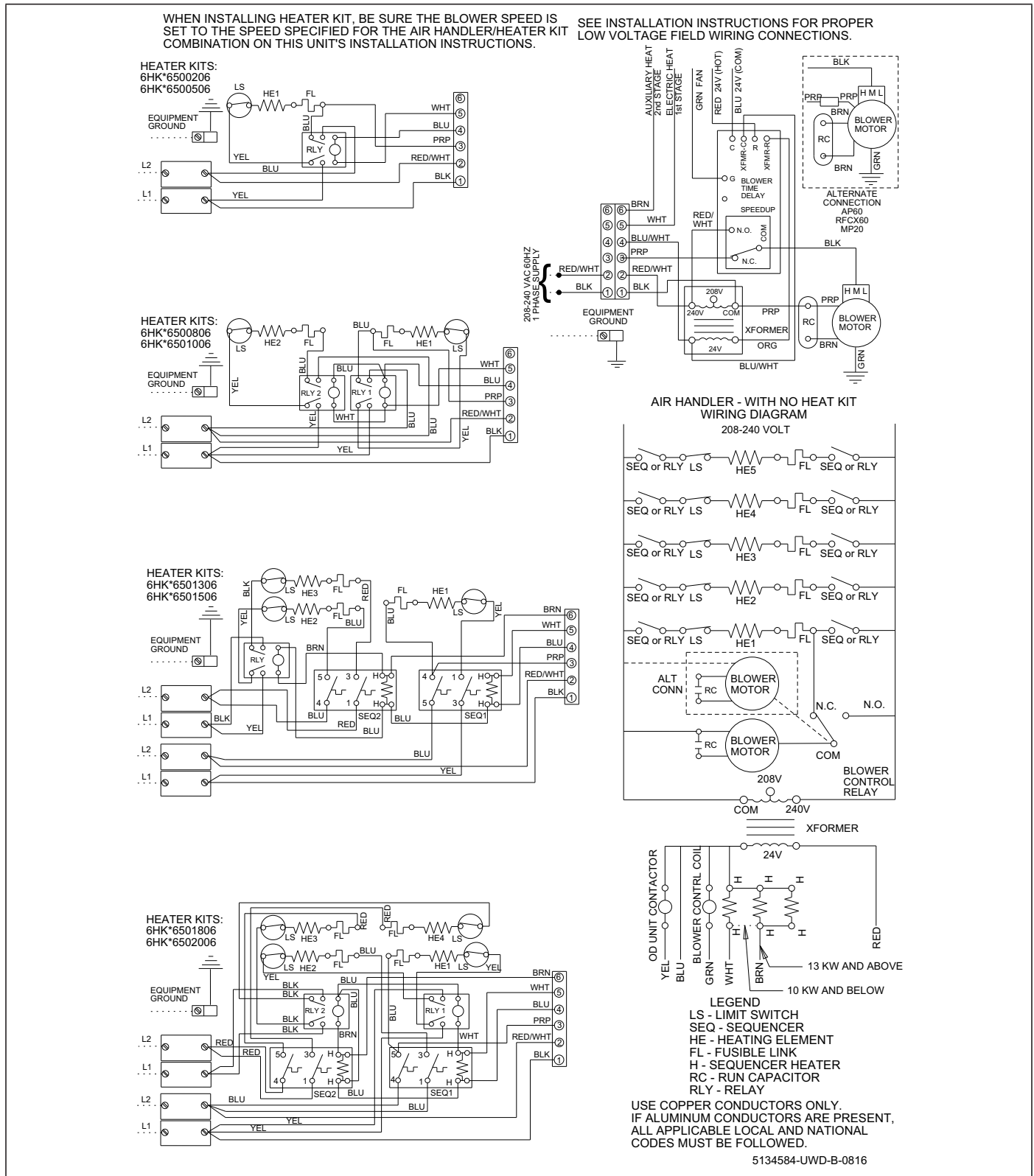
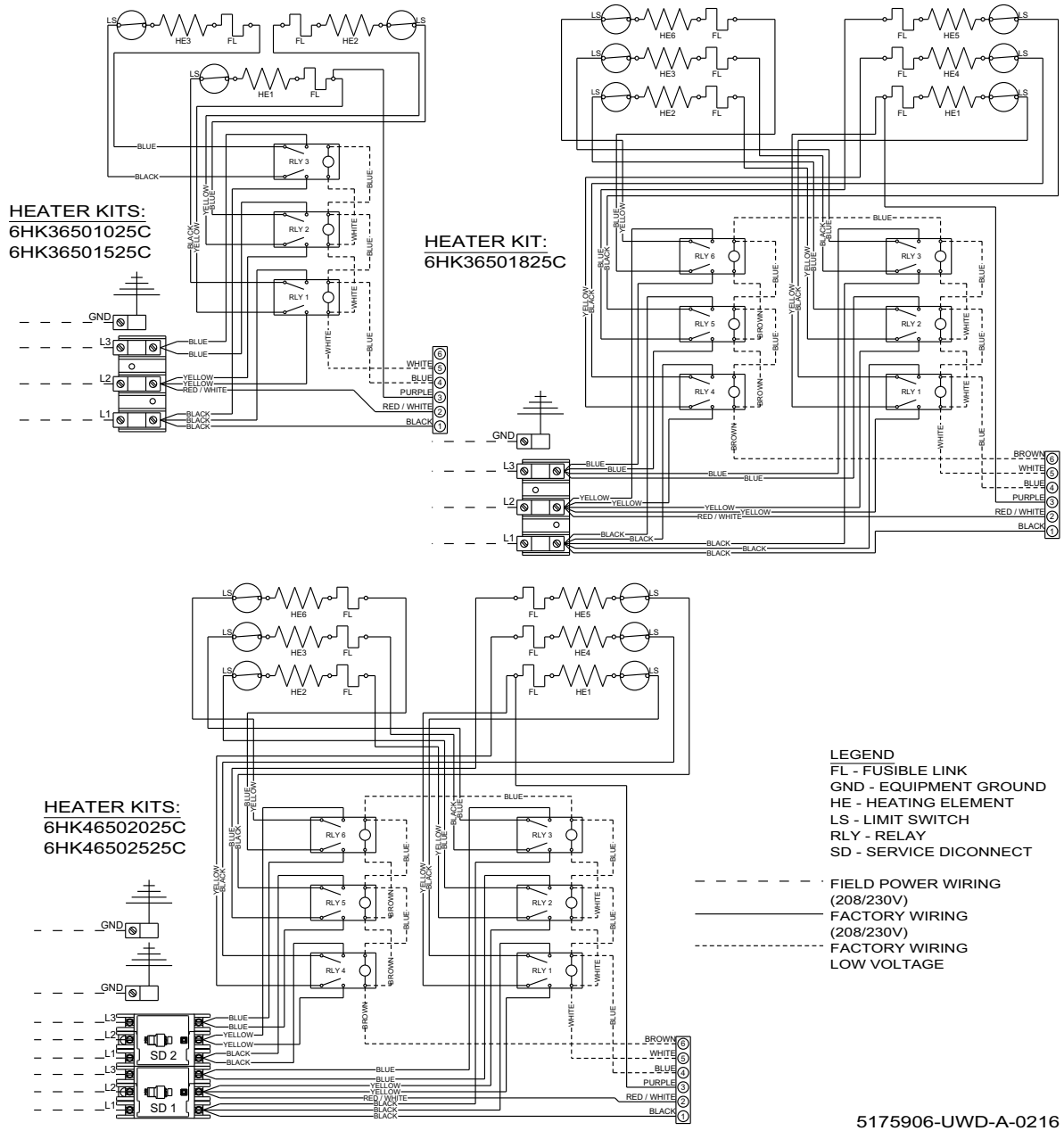


FIGURE 13: Wiring Diagram - PSC - Single Phase Heat Kits

### 3 PHASE ELECTRIC HEAT KITS



5175906-UWD-A-0216

FIGURE 14: Wiring Diagram - Three Phase Heat Kits (208/230V)

SECTION XIV: START UP SHEET

<input type="button" value="Print Form"/>	<b>Residential Air Handler with Electric Heat Start-Up Sheet</b>	<input type="button" value="Reset Form"/>
Proper start-up is critical to customer comfort and equipment longevity		
Start-Up Date <input style="width: 100px;" type="text"/>	Company Name <input style="width: 200px;" type="text"/>	Start-Up Technician <input style="width: 200px;" type="text"/>
<b>Owner Information</b>		
Name <input style="width: 150px;" type="text"/>	Address <input style="width: 250px;" type="text"/>	Daytime Phone <input style="width: 100px;" type="text"/>
City <input style="width: 100px;" type="text"/>	State or Province <input style="width: 150px;" type="text"/>	Zip or Postal Code <input style="width: 100px;" type="text"/>
<b>Equipment Data</b>		
Unit Model # <input style="width: 150px;" type="text"/>	Unit Serial # <input style="width: 200px;" type="text"/>	
<b>General Information</b> (Check all that apply)		
<input type="radio"/> New Construction	<input type="radio"/> Up flow	<input type="radio"/> Horizontal Left
<input type="radio"/> Retrofit	<input type="radio"/> Down flow	<input type="radio"/> Horizontal Right
<b>Unit Location and Connections</b> (Check all that apply)		
<input type="checkbox"/> Unit is level	<input type="checkbox"/> Duct connections are complete:	<input type="checkbox"/> Supply <input type="checkbox"/> Return
<input type="checkbox"/> Condensate drain properly connected per the installation instructions	<input type="checkbox"/> Condensate trap has been primed with water	
<b>Filters</b>		
<input type="checkbox"/> Filters installed	Number of filters <input style="width: 50px;" type="text"/>	Filter size <input style="width: 50px;" type="text"/>
<b>Electrical Connections &amp; Inspection</b> (Complete all that apply)		
<input type="radio"/> 208 volts AC	<input type="radio"/> 230 volt AC	
<input type="checkbox"/> Inspect wires and electrical connections	<input type="checkbox"/> Transformer wired properly for primary supply voltage	<input type="checkbox"/> Ground connected
Line Voltage Measured (Volts AC) <input style="width: 80px;" type="text"/>	Low voltage value between "R" and "C" at control board (Volts AC) <input style="width: 80px;" type="text"/>	
<input type="checkbox"/> Thermostat wiring is complete <input type="checkbox"/> Thermostat cycle rate or heat anticipator adjusted to Installation Manual specifications		
<b>Air Flow Setup</b>		
<b>Blower Type &amp; Set-Up</b>	<input type="radio"/> ECM	COOL <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D
		ADJUST <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D
		DELAY <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D
		HEAT <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D
	<input type="radio"/> X-13	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5
<input type="radio"/> PSC	<input type="radio"/> Low <input type="radio"/> Medium Low <input type="radio"/> Medium <input type="radio"/> Medium High <input type="radio"/> High	
Supply static (inches of water column) <input style="width: 50px;" type="text"/>	Supply air dry bulb temperature <input style="width: 50px;" type="text"/>	Outside air dry bulb temperature <input style="width: 50px;" type="text"/>
Return static (inches of water column) <input style="width: 50px;" type="text"/>	Return air dry bulb temperature <input style="width: 50px;" type="text"/>	Return air wet bulb temperature <input style="width: 50px;" type="text"/>
Total external static pressure <input style="width: 50px;" type="text"/>	Temperature drop <input style="width: 50px;" type="text"/>	Supply air wet bulb temperature <input style="width: 50px;" type="text"/>
<b>Other Jumpers</b> (Check all that apply)		
HUM STAT <input type="radio"/> YES <input type="radio"/> NO	AC/HP <input type="radio"/> AC <input type="radio"/> HP	CONT FAN <input type="radio"/> L <input type="radio"/> M <input type="radio"/> H
Continued on next Page		

**Electric Heat** (Complete all that apply)

Electric heat kit - Model number <input type="text"/>		Serial number <input type="text"/>		Rated KW <input type="text"/>	
Number of elements <input type="text"/>	Measured Amperage	Heater 1 <input type="text"/>	Heater 2 <input type="text"/>	Heater 3 <input type="text"/>	
		Heater 4 <input type="text"/>	Heater 5 <input type="text"/>	Heater 6 <input type="text"/>	
	Measured Voltage	Heater 1 <input type="text"/>	Heater 2 <input type="text"/>	Heater 3 <input type="text"/>	
		Heater 4 <input type="text"/>	Heater 5 <input type="text"/>	Heater 6 <input type="text"/>	
Heating return air dry bulb temperature <input type="text"/>	Heating supply air dry bulb temperature <input type="text"/>	Air temperature rise <input type="text"/>			

**Clean Up Job Site**

- Job site has been cleaned, indoor and outdoor debris removed from job site
- Tools have been removed from unit
- All panels have been installed

**Unit Operation and Cycle Test** (Complete all that apply)

- Operate the unit through continuous fan cycles from the thermostat, noting and correcting any problems
- Operate the unit through cooling cycles from the thermostat, noting and correcting any problems
- Operate the unit through mechanical heating cycles from the thermostat, noting and correcting any problems
- Operate the unit through emergency heating cycles from the thermostat, noting and correcting any problems

**Owner Education**

- Provide owner with the owner's manual
- Explain operation of system to equipment owner
- Explain thermostat use and programming (if applicable) to owner
- Explain the importance of regular filter replacement and equipment maintenance

**Comments and Additional Job Details**