

# Installation Instructions

## Soffit Mount

### Compact Ceiling Mount Air Handlers

Electric or No Heat, with available 5-Speed High Efficiency ECM Motor

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## AIR HANDLER SAFETY

### SAFETY CONSIDERATIONS

Your safety and the safety of others are very important.

We have provided many important safety messages in this manual and on your appliance. Always read and obey all safety messages.



This is the safety alert symbol.

This symbol alerts you to potential hazards that can kill or hurt you and others.

All safety messages will follow the safety alert symbol and signal word. These signals words mean the following:

**DANGER:** You can be **killed or seriously injured** if you don't immediately follow instructions.

**WARNING:** Indicate 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**. Caution may also be used to alert against unsafe practices.

**NOTICE:** Indicates a statement of company policy as the message relates directly or indirectly to the safety of personnel or protection of property.

**IMPORTANT:** More detailed information concerning the statement of company policy as the message relates directly or indirectly to the safety of personnel or protection of property.

All safety messages will tell you what the potential hazard is, tell you how to reduce the chance of injury, and tell you what can happen if the instructions are not followed.



Product improvement is a continuous process at Advanced Distributor Products. Therefore, product specifications are subject to change without notice and without obligation on our part. Please contact your ADP representative or distributor to verify details.

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## GENERAL & CLEARANCES

These instructions are intended as a general guide only and do not supersede any national or local codes in any way. Compliance with all local, state, or national codes pertaining to this type of equipment should be determined prior to installation.

Read this entire instruction manual, as well as the instructions supplied in separate equipment, before starting the installation.

All models are designed for indoor installation only.

The installation of the air handler, field wiring, warm air ducts, etc. must conform to the requirements of the National Electrical Code, ANSI/NFPA No. 70 (latest edition) in the United States, and any state laws, and local ordinances (including plumbing or wastewater codes). Local authorities having jurisdiction should be consulted before installation is made. Such applicable regulations or requirements take precedence over the general instructions in this manual.

This unit is certified for installation clearances to combustible material as listed on the unit rating plate. Accessibility and service clearances must take precedence over combustible material clearances.

### Receiving:

Check equipment for shipping damage. If you find any damage, immediately contact the last carrier.

Check the unit rating plate for unit size, electric heat, coil, voltage, phase etc. to be sure unit matches requirements.

 <b>WARNING</b> 	
<b>Electrical Shock</b>	
Disconnect power before servicing.	
Replace all parts and panels before operating.	
Electrically ground air handler.	
Connect ground wire to ground terminal marked "GRD".	
Failure to do so can result in death or electrical shock.	
<b>Explosion Hazard</b>	
Keep flammable materials and vapors, such as gasoline, away from this unit.	
Place this unit so that the heating elements are at least 18in (46cm) above the floor for a garage insulation.	
Failure to follow these instructions can result in death, explosion or fire.	

### IMPORTANT

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFC's and HFC's) as of July 1, 1992. Approved methods of reclaiming must be followed. Fines and/or incarceration may be levied for non-compliance.

## OUTDOOR SYSTEM REQUIREMENTS

The air handler is designed to match, and must be used with, outdoor units as rated in AHRI. The indoor sections are manufactured with an interchangeable refrigerant metering device to provide optimum refrigerant control and system

performance with a variety of different capacities of outdoor units. In some cases, the AHRI rating may require that the air handler refrigerant metering device be changed to obtain rated performance.

## DUCTWORK

Ductwork 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 .

The air handler is to be placed as close to the space to be air conditioned as possible. Ductwork should be run as directly as possible to the return and supply outlets.

Use of nonflammable weatherproof flexible connectors on both supply and return connections at unit to reduce noise transmission is recommended.

# INSTALLATION

Install the conditioned air plenum, ducts and air filters (not provided) in accordance with NFPA 90B Standard for the Installation of Warm Air Heating and Air-Conditioning Systems (latest edition).

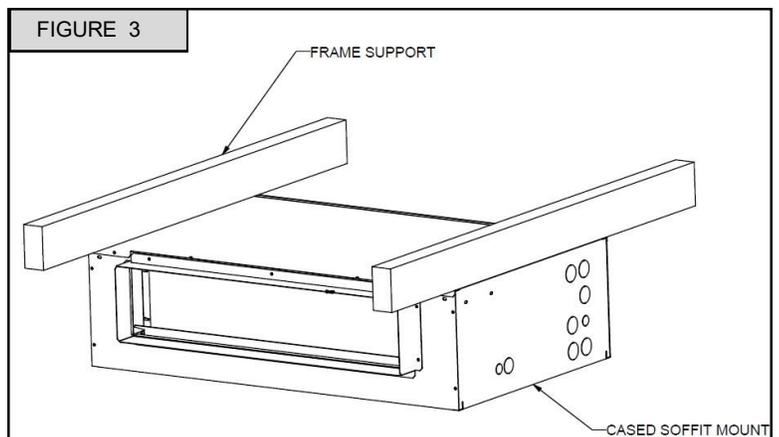
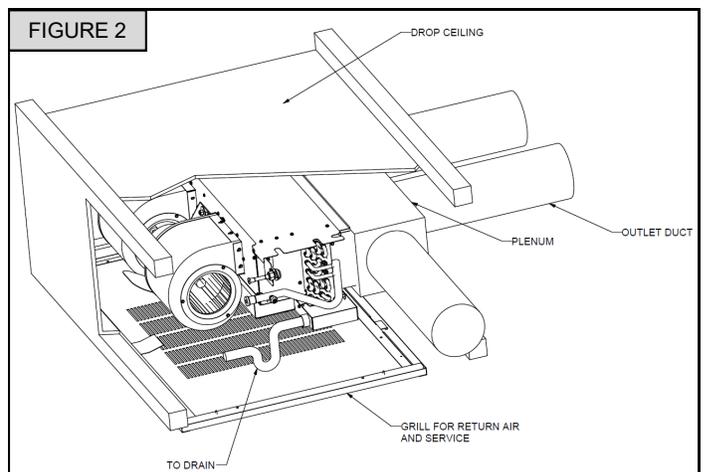
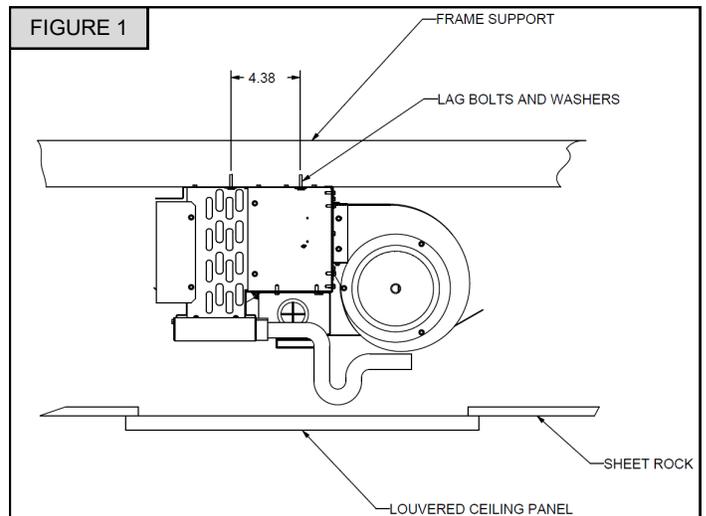
It is the installers responsibility to make sure the strength of the ceiling and beams are adequate to support the weight of the air handler. See the below table for individual weights per model.

Model	Weight (lb.)
CP18, 23	60
CE18, 23	63
CP19, 24, 29	65
CE19, 24, 29	68
CP25, 30	70
CE25, 30	73

The soffit mount air handler is intended to be mounted in a horizontal position above a dropped ceiling of adequate strength. Figure 3 illustrates the cased air handler. For uncased installation refer to figures 1 & 2.. Properly attach unit with lag bolts and washers through the provided top plate slots.

Prior to installation, the installer must also consider air duct/ drain connections, power supply wiring, and proper access for servicing and inspection.

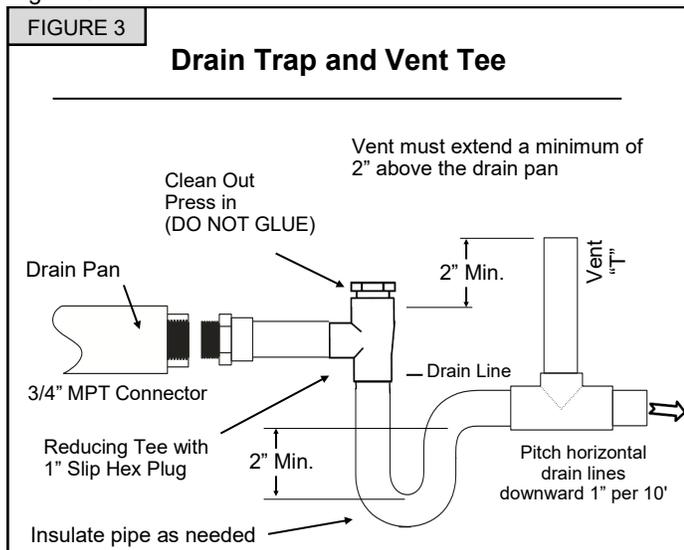
For free return (non-ducted return air) installation: To ensure that return air is being pulled from the conditioned space only, the furred down area must be completely sealed (with exception of return air grille).



## INSTALL CONDENSATE DRAIN

Determine the drain connections to be used and note the difference between the primary and secondary openings. Remove plugs from selected drain openings. It is recommended that  $\frac{3}{4}$ " male pipe thread PVC fittings be used at the condensate pan. **Hand tighten only!** ADP recommends thread sealant to be used on the PVC connector at the drain pan connection.

Tubing for all condensate drains should be a minimum of  $\frac{7}{8}$ " OD. The drain should be pitched downward 1" per 10'. Install a trap as close to the coil as possible (2" minimum). Refer to figure 3.



Route drain line so that it does not interfere with accessibility to the coil, air handling system or filter and will not be exposed to freezing temperatures.

If line makes a second trap, or has an extended run before termination, a vent tee should be installed after the trap closest to the pan. Connect the primary drain and route to an open drain, sump, or sewer line.

### CAUTION

If the coil is located in or above a living space where damage may result from condensate overflow, a separate  $\frac{3}{4}$ " drain must be provided from the secondary drain connection (**or a Float Switch can be used - refer to kit instructions for installation procedures**). Run this drain to a place in compliance with local installation codes where it will be noticed when unit is operational. Condensate flowing from the secondary drain indicates a plugged primary drain.

Prime the trap with water. Test line for leaks. Verify water flow with unit in operation.

Do not allow the drain pan coupling to support the weight of the drain line. Secure the drain line with a strap or other equivalent method to ensure the line is perpendicular to the face of the drain pan.

## REFRIGERANT PIPING & FLOW CONTROLS

Refrigerant connections are  $\frac{3}{8}$ " ODF Liquid and  $\frac{3}{4}$ " ODF Suction. Refer to outdoor unit manufacturer's recommendation on line sizing.

During brazing of refrigerant lines place a wet rag around suction line to protect cabinet or ceiling from overheating. Maintain a minimum of 1.5" from refrigerant brazing connections and cabinet or ceiling.

Refer to nomenclature to determine type of flow control installed and needed for your application. Evaporator coils are shipped from the factory with flator pistons or TXV assemblies. Flator pistons and TXV kits are available for field conversion.

### PISTONS

As shipped from the factory, the piston installed in each coil is chosen for the nominal BTUH capacity of the coil. Verify with the condenser recommendation that proper flator piston is selected.

When changing pistons use the following procedure:

1. Loosen hex nut located on liquid line and separate from distributor assembly.
2. Remove the existing piston from inside the distributor assembly

3. Insert the desired piston into the distributor assembly.
4. Inspect "O" ring and replace if damaged. Ensure gasket is in place.
5. Re-install hex nut to body and torque to 10 ft-lbs.

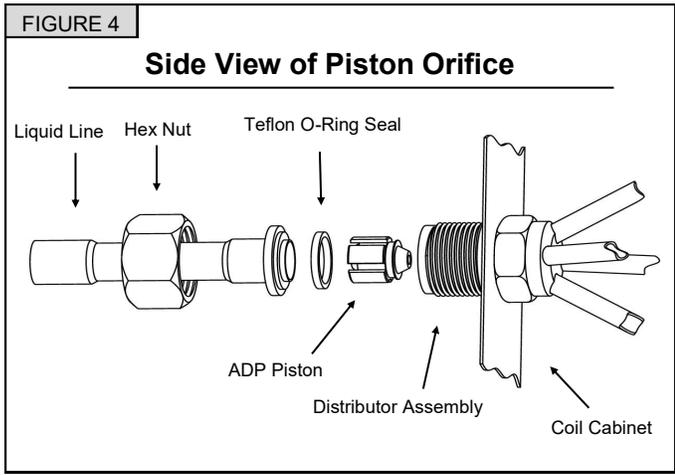
### THERMAL EXPANSION VALVES

As shipped from the factory, the TXV installed in each coil is chosen for the nominal BTUH capacity of the coil. Attach and insulate the TXV bulb outside of the cabinet to the main suction line no more than one foot from the suction line connection.

Field installed TXV kits are also available. Refer to engineering guide or price sheet for sizes, and kit instructions for installation procedures.

### REFRIGERANT LINE INSTALLATION

ADP recommends installing a filter drier and sight glass in the liquid line. While brazing, purge the system with Nitrogen to prevent contamination. ADP recommends reattaching and insulating the TXV sensing bulb at a 10 to 2 o'clock position on the suction line, outside the coil housing, no more than one foot from the connection. Evacuate the system to 500 microns to ensure proper air and moisture removal (**Note: Deep evacuation or triple evacuation method recommended**). Open the suction service valve slowly and allow the refrigerant to bleed into the system before opening the liquid service valve.



**ELECTRICAL REQUIREMENTS**

**WARNING**

**Electrical Shock Hazard**

**Electrically ground electric heater.**  
**Connect ground wire to ground terminal marked "GND".**  
**Use copper wire rated for supply connection.**  
**Correct wire gauge is shown in the chart below.**  
**Failure to follow these instructions can result in death or electrical shock.**

Rating Plate Ampacity	AWG
21-30	10
31-40	8
41-60	6

- All field wiring must be done in accordance with National Electrical Code, applicable requirements of UL and local codes, where applicable.
- Electrical wiring, disconnect means and over-current protection are to be supplied by the installer. Refer to the air handler rating plate for maximum over-current protection, minimum circuit Ampacity, as well as operating voltage.
- The power supply must be sized and protected according to the specifications supplied on the product.
- This air handler is factory configured for 240 Volt, single phase, 60 cycles. For 208 Volt applications, see "208 Volt Conversion" in the "Make Electrical Connections" section.
- For optional electric heater applications refer to the instructions provided with the accessory for proper installation.

**NOTE:** Use copper conductors only.

**ELECTRICAL CONNECTIONS**

1. Models with electric heat: Determine the number of circuits needed to supply the heater with electrical power. See the air handler Accessory Kit label for number of circuits and ratings.
2. Disconnect all power supplies.
3. Remove the control panel.
4. Using the pre-punched wiring holes, install UL listed wires and fittings.
5. Connect appropriate size wire to the pull disconnect terminals.
6. Connect green ground wire(s) (1 or 2) to the ground terminal(s) (1 or 2) marked "GND".
7. Install conduit-opening plugs in any unused openings.
8. Reinstall the air handler control panel.
9. Reconnect power.
10. Dispose of all remaining parts.

**WARNING**

**Electrical Shock Hazard**

**Disconnect all power supplies before servicing.**  
**Replace all parts and panels before operating.**  
**Failure to do so can result in death or electrical shock.**

## FILTERS

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Filters are not provided with unit, and must be supplied and installed in the return air system by the installer. A field installed filter grille is recommended for easy and convenient access to the filters for periodic inspection and cleaning. Filters must have adequate face area for the rated air quantity of the unit.

## REFRIGERANT CHARGING INSTRUCTIONS

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When charging in cooling mode, the outdoor temperature should be 60°F or higher. To allow the pressures to stabilize, operate the system a minimum of 15 minutes between adjustments. When adjusting charge to systems with micro-channel outdoor coils, make small (1 ounce or less) adjustments as these systems are very sensitive to refrigerant charge.

**TXV Charging<sup>2, 3, 4</sup>**– Use the charging method recommended by the outdoor unit instructions. Alternatively, ADP recommends charging to 12°F sub-cooling for AC units and 10°F sub-cooling for heat pump units. In addition, if equipped with an adjustable valve, adjust to 10°F superheat.

**Fixed Orifice Charging<sup>2, 3, 4</sup>**– Use the superheat recommended by the outdoor unit instructions. Alternatively, ADP recommends charging to the superheat table below.

For heat pump units initially charged in the cooling mode, final adjustments to charge in the heating mode are acceptable if necessary. Some heat pump units require charging in the heating mode. In this case, refer to the outdoor instructions for recommended charging procedures.

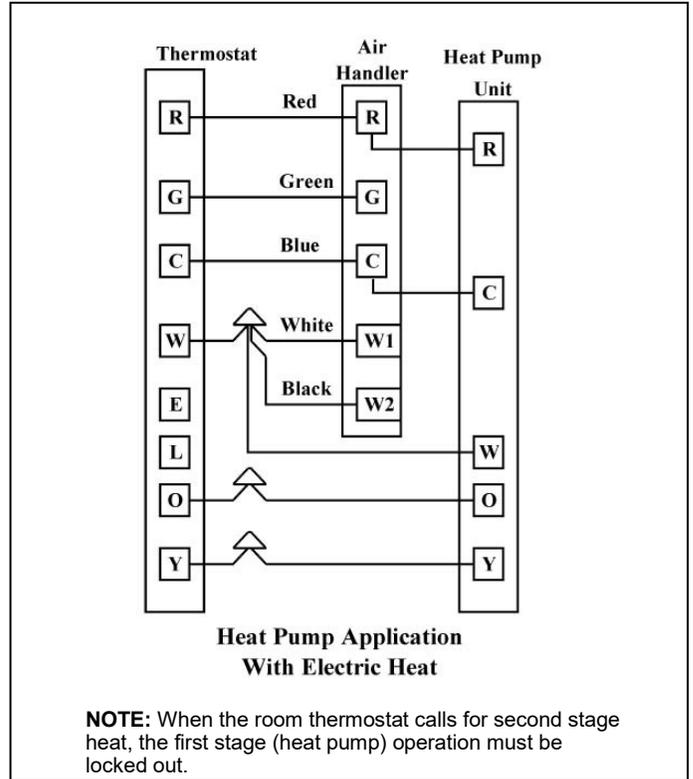
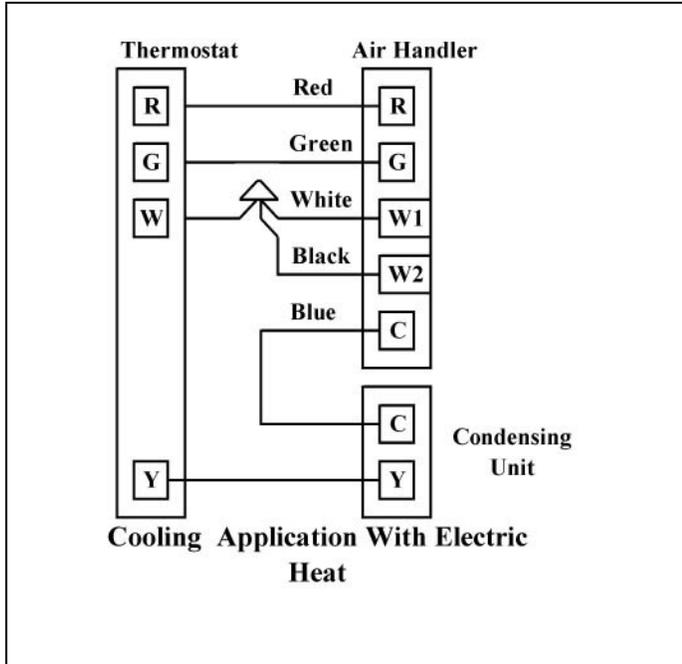
If the system is undercharged after the initial charge, add refrigerant until the sight glass is clear and recommended pressures, temperatures, sub-cooling and superheat can be obtained. If the system is overcharged after the initial charge, recover refrigerant until recommended pressures, temperatures, sub-cooling and superheat can be obtained.

**Notes:**

1. If any problems or questions regarding charge occur, contact customer service.
2. OEM charging methods vary depending on design and application. Verify all recommended pressures, temperatures, sub-cooling and superheat settings result in the proper charge.
3. ADP coils may require charge compensation due to size variation versus the OEM coil.
4. Temperatures are  $\pm 2^\circ\text{F}$  unless otherwise recommended.

# LOW VOLTAGE THERMOSTAT CONNECTIONS

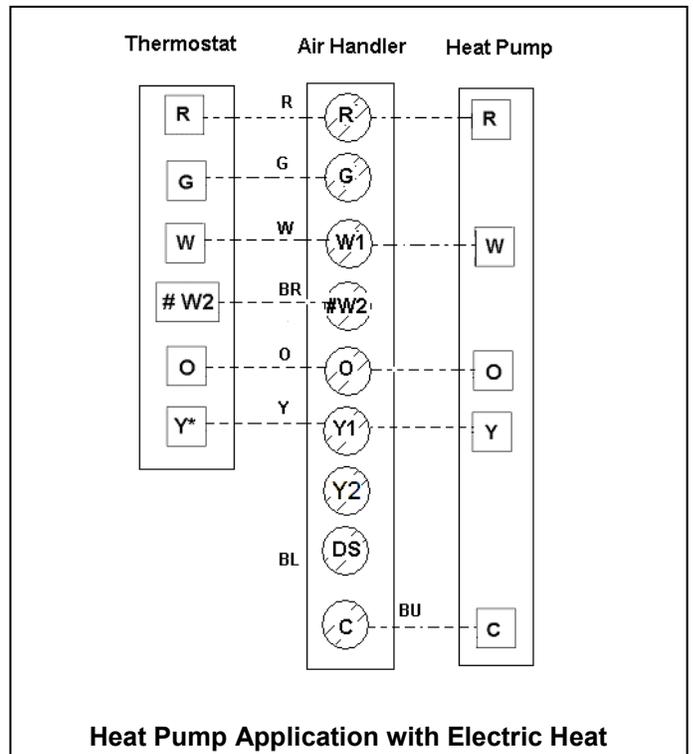
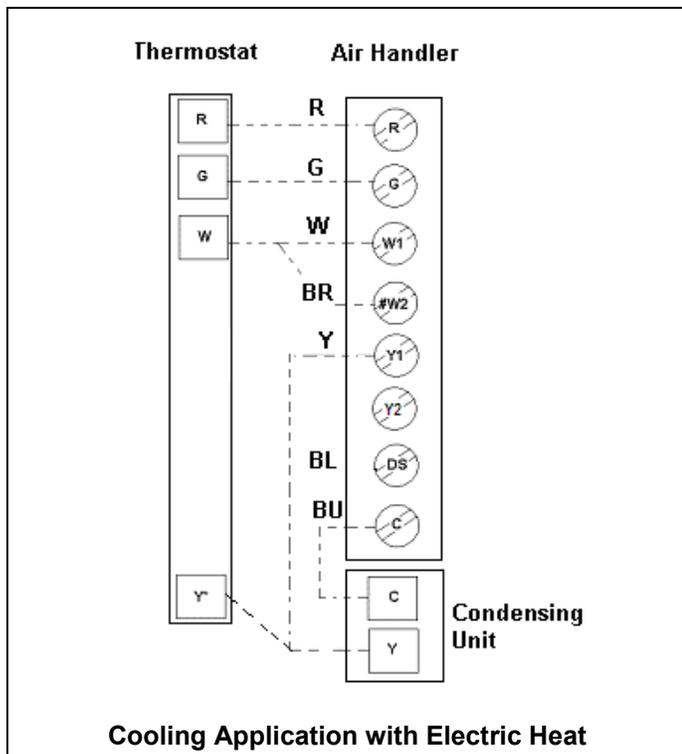
## Thermostat Connections: 2-speed Motor



## Low Voltage Thermostat Connections – 5-speed ECM Constant Torque Motor

For 2 stage outdoor units:

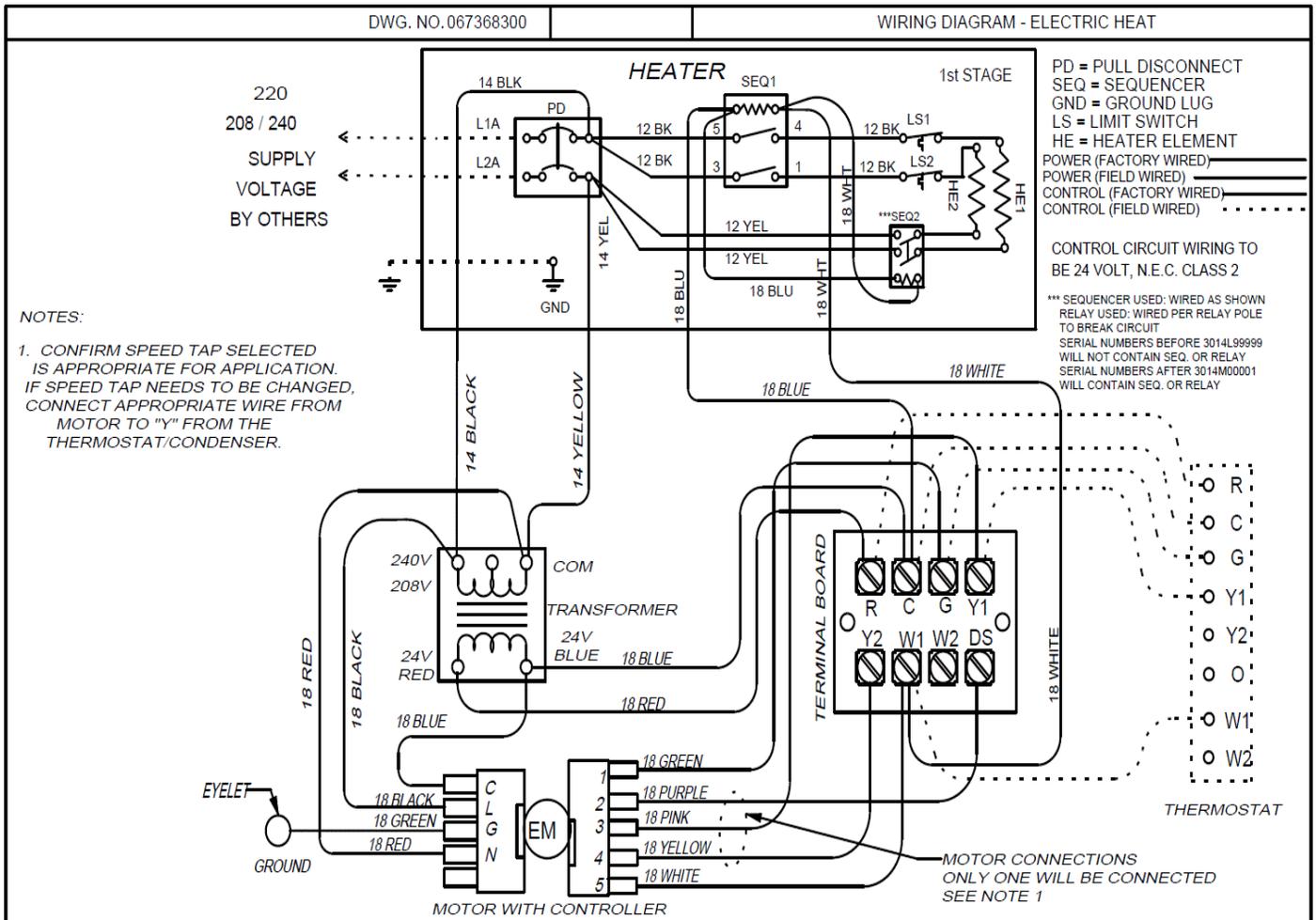
- Use the airflow chart to identify the desired CFM for 1st and 2nd stage operation.
- For 1st stage, connect Y1 from the thermostat to the desired Tap on the terminal board.
- For 2nd stage, connect Y2 from the thermostat to the desired Tap on the terminal board.





# WIRING DIAGRAM

## ECM Constant Torque Motor



## ELECTRICAL DATA

### ECM Constant Torque Motor

Unit Size (All have electric heat)	Heating Capacity		Blower Amps		Minimum Circuit Ampacity		Pull Disconnect Amps Per Stage
	kW	BTUH	208 V	240 V	208 V	240 V	
	240 V [1]	240 V [1]					
18, 19	3.0	10,236	2.0	2.0	16.0	18.1	30
	5.0	17,060	2.0	2.0	24.1	27.5	30
	6.0	20,472	2.0	2.0	29.5	33.8	45
	8.0	27,296	2.0	2.0	38.5	44.2	45
23, 24, 25, 29	3.0	10,236	2.0	2.0	16.0	18.1	30
	5.0	17,060	2.0	2.0	24.1	27.5	30
	6.0	20,472	2.0	2.0	29.5	33.8	45
	8.0	27,296	2.0	2.0	38.5	44.2	45
30	10.0	34,120	2.0	2.0	41.6	54.5	60
	5.0	17,060	2.0	2.0	24.1	27.5	30
	6.0	20,472	2.0	2.0	29.5	33.8	45
	8.0	27,296	2.0	2.0	38.5	44.2	45
	10.0	34,120	2.0	2.0	41.6	54.5	60

[1] For 208 Volts use .751 correction factor for kW & MBTUH.

# BLOWER PERFORMANCE DATA

## 2-speed PSC Motor:

- All data is given while air handler is operating with a dry coil and without air filter installed.
- Speeds marked **\*bold with asterisk** are the factory speed settings for both heating and cooling.
- Heating speeds should not be reduced below factory setting.

Unit Size	Blower Speed Setting	Airflow (CFM) vs. External Static Pressure (inches W.C.) ***				
		0.1	0.2	0.3	0.4	0.5
18	Low - Red	610	536	468	392	316
	<b>* ^ High -Black</b>	680	607	532	456	368
23	Low - Red	846	777	702	627	546
	<b>* ^ High -Black</b>	902	830	755	667	589
19, 24, 29	Low - Red	833	781	725	658	580
	<b>* ^ High -Black</b>	1039	976	903	825	728
25, 30	Low - Red	839	771	706	644	553
	<b>* ^ High -Black</b>	1050	975	901	820	744

\* Factory setting for cooling.

^ Factory setting for heating.

\*\*\* All airflow data is with a dry coil & electric heat.

## ECM Constant Torque Motor:

- All data is given while air handler is operating with a dry coil and without air filter installed.
- For cooling select the tap that corresponds with the desired CFM
- Heating speeds should not be reduced below factory setting.

Unit Size	Blower Speed Setting	Airflow (CFM) vs. External Static Pressure (inches W.C.) ***				
		0.1	0.2	0.3	0.4	0.5
18, 23	Tap 1 (G)	604	514	453	437	301
	Tap 2 (DS)	604	514	453	437	301
	Tap 3 (Y1)	735	651	577	506	444
	Tap 4 (Y2)	890	826	764	700	605
	^ Tap 5 (W1)	890	826	764	700	605
19, 24, 29	Tap 1 (G)	618	547	464	344	270
	Tap 2 (DS)	617	547	469	351	273
	Tap 3 (Y1)	779	720	633	549	441
	Tap 4 (Y2)	940	876	812	750	675
	^ Tap 5 (W1)	937	875	812	750	674
25, 30	Tap 1 (G)	630	557	485	380	277
	Tap 2 (DS)	630	556	483	378	277
	Tap 3 (Y1)	803	719	640	576	521
	Tap 4 (Y2)	981	909	833	766	705
	^ Tap 5 (W1)	984	909	837	769	709

^ Factory setting for heating.

\*\*\* All airflow data is with a dry coil & electric heat.

## AIR HANDLER CHECKS

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### Check Blower Operation

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1. Set thermostat to FAN ON.
2. The indoor blower should come on.

### Check Electric Heater (if used)

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1. Set thermostat to call for auxiliary heat (approximately 5°F above ambient temperature). The indoor blower and auxiliary heat should come on together. Allow a minimum of three minutes for all sequencers to cycle on.
2. Set the thermostat so it does not call for heat. Allow up to five minutes for all sequencers to cycle off.

### Check Airflow

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#### Cooling Blower Speed:

- For proper cooling operation, the airflow through the indoor coil should be between 350 and 450 CFM per ton of cooling capacity (350 - 450 CFM per 12,000 BTU/HR) based on the rating of the outdoor unit.
- The cooling blower speed is factory configured to provide correct airflow for an outdoor unit that matches the maximum cooling capacity rating of the air handler.
- If the outdoor unit is smaller than the maximum cooling capacity rating for the air handler, the cooling blower speed may need to be changed. Refer to "Blower Performance Data."

**IMPORTANT:** The cooling blower speed must be set to provide a minimum of 350 CFM airflow per ton (12,000 BTU/HR) of outdoor cooling capacity.

## AIR HANDLER MAINTENANCE

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At the beginning of each heating season the unit should be serviced by a qualified installer or servicing agency.

## ASSITANCE OR SERVICE

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If you need further assistance, you may contact us at the address below with any questions or concerns. Please include a daytime phone number in your correspondence.

Advanced Distributor Products  
1995 Air Industrial Park Road  
Grenada, MS 38901  
[www.adpnow.com](http://www.adpnow.com)

	<b>WARNING</b>	
		
<b>Electrical Shock Hazard</b>		
<b>Disconnect all power supplies before servicing.</b>		
<b>Replace all parts and panels before operating.</b>		
<b>Failure to do so can result in death or electrical shock.</b>		

# ADP AIR HANDLER LIMITED WARRANTY

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## Term of Warranty

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Advanced Distributor Products (ADP) warrants that products sold shall be of merchantable quality, free of defects in material and workmanship, under normal use and service, for a period of five (5) years from the date of installation, **not** to exceed six (6) years from the date of manufacture subject to the terms of ADP's limited warranty.

For information on this product's warranty, including accessing complete warranty terms, registering for an extended warranty\* or instructions on filing a warranty claim, please go to [www.ADPwarranty.com](http://www.ADPwarranty.com).

*\* In such states or provinces where registration requirements are prohibited, failure to complete registration by the consumer does not diminish his or her warranty rights.*

## Equipment Information

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Please *complete information below and retain this warranty for records and future reference.*

Unit Model Number: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Installing Contractor: \_\_\_\_\_

Installation Date: \_\_\_\_\_

Phone: \_\_\_\_\_

