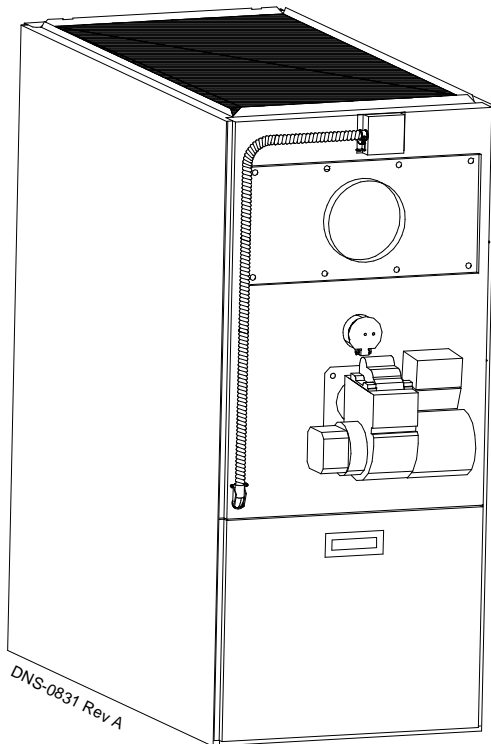


# Installation Instructions and Homeowner's Manual

## **OIL FURNACE UPFLOW & HORIZONTAL**



**Models:**

**AMP300B34-SE2PMA**

**OTF210G21B**



**INSTALLER / SERVICE TECHNICIAN:**

**USE THE INFORMATION CONTAINED IN THIS MANUAL FOR THE INSTALLATION / SERVICING OF THE FURNACE AND KEEP THE DOCUMENT NEAR THE UNIT FOR FUTURE REFERENCE.**

**HOMEOWNER:**

**PLEASE KEEP THIS MANUAL NEAR THE FURNACE FOR FUTURE REFERENCE.**

**Caution:** Do not tamper with the unit or its controls.  
Call a qualified service technician.

Manufactured by:

**Dettson Industries inc.**

3400 Industrial Boulevard  
Sherbrooke, Quebec – Canada – J1L 1V8  
[www.dettson.ca](http://www.dettson.ca)

# PART 1 INSTALLATION

## SAFETY CONSIDERATIONS

INSTALLATION OF OIL FIRED HEATING UNITS SHALL BE IN STRICT ACCORDANCE WITH THE REGULATIONS OF THE AUTHORITIES HAVING JURISDICTION. IN CANADA, CSA B139 AND IN THE UNITED STATES NFPA NO.31-1992 INSTALLATION CODE FOR OIL BURNING EQUIPMENT.

DO NOT OPERATE FURNACE IN A CORROSIVE ATMOSPHERE CONTAINING CHLORINE, FLUORINE OR ANY OTHER DAMAGING CHEMICALS.

DO NOT STORE OR USE GASOLINE, OR OTHER FLAMMABLE VAPOURS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

### 1.1) SAFETY LABELING AND WARNING SIGNS

#### DANGER, WARNING AND CAUTION

The words DANGER, WARNING and CAUTION are used to identify the levels of seriousness of certain hazards. It is important that you understand their meaning. You will notice these words in the manual as follows:



#### DANGER

Immediate hazards which **WILL** result in death or serious injury.



#### WARNING

Hazards or unsafe practices which **CAN** result in death or injury.

#### CAUTION

Hazards or unsafe practices which **CAN** result in personal injury or product or property damage.

### 1.2) SAFE INSTALLATION REQUIREMENTS



#### WARNING

Installation or repairs made by unqualified persons can result in hazards to you and others. Installation **MUST** conform to local codes or, in the absence of local codes, to codes of the country having jurisdiction.

The information contained in this manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments.

Failure to carefully read and follow all instructions in this manual can result in furnace malfunction, property damage, personal injury and/or death.



#### WARNING

##### Fire hazard

The furnace must be installed in a level position, never where it will slope toward the front.

If the furnace is not installed level, oil will drain into the furnace vestibule and create a fire hazard, instead of being directed into the combustion chamber.

**NOTE:** It is the personal responsibility and obligation of the customer to contact a qualified installer to ensure that the installation conforms to governing local and/or national codes and ordinances.

- This furnace is NOT approved for installation in mobile homes, trailers or recreational vehicles;
- Do **NOT** use this furnace as a construction heater or to heat a building under construction;
- There must be a sufficient supply of fresh air for combustion and ventilation to the area in which the furnace is located;
- Use only the type of fuel oil approved for this furnace (see **Rating Plate** on unit). Overfiring will result in heat exchanger failure and cause dangerous operating conditions;
- Visually check all oil line joints for signs of leakage;
- Connect furnace to the chimney;
- The points in Part 2 "Operation" are vital to the proper and safe operation of the heating system. Take the time to ensure that all steps were followed;
- Follow the regulations in the NFPA Pamphlet No.31 (in the USA) and B-139 (in Canada) or local codes for placing and installing the oil storage tank;
- Follow a regular service and maintenance schedule for efficient and safe operation;
- Before servicing, allow furnace to cool down. Always shut off electricity and fuel to furnace when servicing. This will prevent electrical shock or burns;
- Seal supply and return air ducts;

- l. The vent system **MUST** be checked to determine that it is the correct type and size;
- m. Install correct filter type and size;
- n. Unit **MUST** be installed so electrical components are protected from direct contact with water.

### 1.2.1) Safety Rules

Your unit is built to provide many years of safe and dependable service providing it is properly installed and maintained. However, abuse and/or improper use can shorten the life of the unit and create hazards for you, the owner.


- a. The U.S. Consumer Product Safety Commission recommends that users of oil-burning appliances install carbon monoxide detectors. There can be various sources of carbon monoxide in a building or dwelling. The sources could be gas-fired clothes dryers, gas cooking stoves, water heaters, furnaces, gas-fired fireplaces, wood fireplaces, and several other items. Carbon monoxide can cause serious bodily injury and/or death. Therefore, to help alert people of potentially dangerous carbon monoxide levels, you should have carbon monoxide detectors listed by a nationally recognized agency (e.g. Underwriters Laboratories or International Approval Services) installed and maintained in the building or dwelling (see Note).
- b. There can be numerous sources of fire or smoke in a building or dwelling. Fire or smoke can cause serious bodily injury, death, and/or property damage. Therefore, in order to alert people of potentially dangerous fire or smoke, you should have fire and smoke detectors listed by Underwriters Laboratories installed and maintained in the building or dwelling (see Note below).

**NOTE:** The manufacturer of your furnace does not test any detectors and makes no representations regarding any brand or type of detector.

**CAUTION**

Insure that the area around the combustion air intake terminal is free of snow, ice and debris.

### 1.2.2) Freezing temperatures and your building

 **WARNING**

**Freezing temperature warning.**

**Turn off water supply.**

**If your heater remains shut off during cold weather, the water pipes could freeze and burst, resulting in serious water damage.**

Your unit is equipped with safety devices that may keep it from operating if sensors detect abnormal conditions such as clogged exhaust flues.

If the structure is unattended during cold weather you should take the following precautions:

- a. Turn off main water supply into the structure and drain the water lines if possible. Open faucets in appropriate areas;
- b. Have someone check the structure frequently during cold weather to make sure it is warm enough to prevent pipes from freezing. Contact a qualified service agency, if required.

### 1.2.3) Installation regulations

All local and national code requirements governing the installation of oil burning equipment, wiring and flue connections **MUST** be followed. Some of the codes that may be applicable are:

CSA B139	Installation code for oil burning equipment
NFPA 31	Installation of oil burning equipment
ANSI/NFPA 90B	Warm air heating and air conditioning systems
ANSI/NFPA 70	National electrical code
CSA C22.1	Canadian electrical code
ANSI/NFPA 211	Chimneys, fireplaces, vents and solid fuel burning appliances

Only the latest issues of the above codes should be used.

### 1.3) POSITIONING THE FURNACE

The unit must be installed in a location where the ambient and return air temperatures are over 15°C (60°F).

**CAUTION**

Carefully check your furnace upon delivery for any evidence of damage that may have occurred during shipping and handling. Any claims for damages or lost parts must be made with the Transport Company.

As this unit may be installed in an upflow or horizontal configuration (right or left), it may be located in a basement, on the same level as the area to be heated, suspended, or in a crawlspace. In any case, the unit should always be installed level.

In a basement, or when installed on the floor (as in a crawlspace), it is recommended that the unit be installed on a concrete pad that is 1 to 2 inches thick.

When installed in a horizontal position, the furnace may be suspended by using an angle iron frame, as long as the total weight of both the furnace and the frame are considered in the support strength calculations. (Other methods of suspending are acceptable.) When installed in the horizontal position, this furnace must not be installed on combustible flooring, unless the approved sub-base is used (Model HFB-101).

This furnace is approved for reduced clearances to combustible construction.

**The required minimum clearances for this furnace in all positions are specified in Table 2.2, P. 13.**

The furnace should be located as closely as possible to the chimney or vent, in order to keep vent connections short and direct. It should also be as close as possible to the center of the air distribution system.

**CAUTION**

Do **NOT** operate furnace in a corrosive atmosphere containing chlorine, fluorine or any other damaging chemicals. Refer to paragraph 1.5.2.



## WARNING

### Electrical shock hazard.

**This furnace is not watertight and is not designed for outdoor installation. This furnace shall be installed in such a manner as to protect the electrical components from water.**

**Outdoor installation would lead to a hazardous electrical condition and to premature furnace failure, property damage, bodily injury or death.**

## 1.4) VENTING



## WARNING

**Poisonous carbon monoxide gas, fire as well as explosion hazard.**

**Read and follow all instructions in this section.**

**Failure to properly vent this furnace can result in property damage, personal injury and/or death.**

## CAUTION

When the furnace (chimney installation) is vented together with other combustion appliances such as a water heater, the allowable venting materials ("L"-Vent etc.) for use with those appliances must be investigated.



## WARNING

**Poisonous carbon monoxide gas hazard.**

**Never install a hand operated damper in the vent pipe. However, any Underwriters Laboratories listed electrically operated automatic type vent damper may be installed if desired. Be sure to follow instructions provided with vent damper. Read and follow all instructions in this section.**

**Failure to properly vent this furnace or other appliances can result in property damage, personal injury and/or death.**

Venting of the furnace should be to the outside and in accordance with local codes and other authorities having jurisdiction.

**OIL FIRED APPLIANCES SHALL BE CONNECTED TO FLUES HAVING SUFFICIENT DRAFT AT ALL TIMES TO ENSURE SAFE AND PROPER OPERATION OF THE APPLIANCE.**

For additional venting information refer to ANSI/NFPA 211 Chimneys, Fireplaces, Vents and Solid Fuel Burning Appliances and/or CSA B139 Installation Code.

This furnace is certified for use with Type "L" vent (maximum flue gas temperature 575°F (302° C)). The flue pipe clearance knockout in the front top or side panel should be removed. Install the flue elbow so that it exits the furnace cabinet through that opening.

Pre-installation vent system inspection:

Before this furnace is installed, it is highly recommended that any existing vent system be completely inspected.

For any chimney or vent, this should include the following:

- Inspection for any deterioration in the chimney or vent. If deterioration is discovered, the chimney must be repaired or the vent must be replaced;
- Inspection to ascertain that the vent system is clear and free of obstructions. Any blockages must be removed before installing this furnace;
- Cleaning the chimney or vent if previously used for venting a solid fuel burning appliance or fireplace;
- Confirming that all unused chimney or vent connections are properly sealed;
- Verification that the chimney is properly lined and sized per the applicable codes. (Refer to list of codes on page 4.)

### Masonry Chimney

This furnace can be vented into an existing masonry chimney. This furnace must not be vented into a chimney servicing a solid fuel-burning appliance. Before venting this furnace into a chimney, the chimney must be checked for deterioration and repaired if necessary. The chimney must be properly lined and sized per local or national codes.

If the furnace is vented into a common chimney, the chimney must be of sufficient area to accommodate the total flue products of all appliances vented into the chimney.

The following requirements are provided to ensure a safe venting system :

- Ensure that the chimney flue is clear of any dirt or debris;
- Ensure that the chimney is not servicing an open fireplace;
- Never reduce the pipe size below the outlet size of the furnace;
- All pipes should be supported using the proper clamps and/or straps. These supports should be at least every 4 feet;
- All horizontal runs of pipe should have at least a ¼ inch per foot of upward slope;
- All runs of pipe should be as short as possible, with as few turns as possible;
- Seams should be tightly joined and checked for leaks;
- The flue pipe must not extend into the chimney but be flush with the inside wall;
- The chimney must extend 3 feet above the highest point where it passes through a roof of a building and at least 2 feet higher than any portion of a building within a horizontal distance of 10 feet. It shall also be extended at least 5 feet above the highest connected equipment flue collar;
- Check local codes for any variances.

### Factory Built Chimneys

This furnace may be used with an approved factory built chimney. Refer to chimney manufacturer's instructions for proper installation

#### 1.4.1) Barometric draft control

The barometric draft control shipped with the furnace **MUST** be used to ensure proper operation. Installation instructions are enclosed with the control.

## 1.5) COMBUSTION AIR



### WARNING

**Poisonous carbon monoxide gas hazard.**

**Comply with ANSI/NFPA (in the U.S.) or CSA (in Canada) standards for the installation of Oil Burning Equipment and applicable provisions of local building codes to provide combustion and ventilation air.**

**Failure to provide adequate combustion and ventilation air can result in personal injury and/or death.**

### 1.5.1) General

Oil furnaces must have an adequate supply of combustion air. It is common practice to assume that older homes have sufficient infiltration to accommodate the combustion air requirements of the furnace. However, home improvements such as new windows, doors, and weather stripping have dramatically reduced the volume of air infiltration into the home.

Home air exhausters are common. Bathroom and kitchen fans, power vented clothes dryers, and water heaters all tend to create negative pressure in the home. Should this occur, the chimney becomes less and less effective and can easily downdraft.

Heat Recovery Ventilation (HRV) systems are gaining in popularity. HRVs are not designed to supply combustion air. If not properly balanced, a serious, negative pressure condition could develop in the dwelling.

### 1.5.2) Contaminated Combustion Air

Installation in certain areas or types of structures will increase the exposure to chemicals or halogens which may harm the furnace. These instances will require that only outside air be used for combustion.

The following areas or types of structures may contain or be exposed to the substances listed below. The installation must be carefully evaluated, as it may be necessary to provide outside air for combustion.

- Commercial buildings;
- Buildings with indoor pools;
- Furnaces installed near chemical storage areas.

Exposure to these substances :

- Permanent wave chemicals for hair;
- Chlorinated waxes and cleaners;
- Chlorine based swimming pool chemicals;
- Water softening chemicals;
- De-icing salts or chemicals;
- Carbon tetrachloride;
- Halogen type refrigerants;
- Cleaning solvent (such as perchloroethylene);
- Printing inks, paint removers, varnishes, etc.;
- Hydrochloric acid;
- Solvent based cements and glues;
- Antistatic fabric softeners for clothes dryers;
- Acid based masonry cleaning materials.

## 1.6) OIL TANKS AND LINES

Check your local codes for the installation of the tank and accessories.

A manual shut-off valve and an oil filter shall be installed in sequence from tank to burner. Be sure that the oil line is clean before connecting to the burner. The oil line should be protected to eliminate any possible damage. Installations having the fuel oil tank below the burner level must employ a two pipe fuel supply system with an appropriate fuel pump (for more than an 8 foot rise use a 2 stage pump and for more than a 16 foot rise use an auxiliary pump).

Follow the pump manufacturer's instructions to determine the size of tubing you need in relation to the rise, or the horizontal distance.

Inspect the entire distribution system for leaks at the beginning of each heating season.

### 1.7) BURNER INSTALLATION

**IMPORTANT:** The burner must always be installed in the upright position with the ignition control on top.

### CAUTION

**NEVER** use the "interrupted ignition" function if a Honeywell R7184 series combustion relay is installed on the burner.

### Mounting the burner

- The warm air furnace burner mounting plate has a four bolt configuration;
- Position the mounting gasket between the mounting flange and the appliance burner mounting plate. Line up the holes in the mounting flange with the studs on the appliance mounting plate and securely bolt in place.

### After the burner is mounted

- Remove drawer assembly or air tube combination;
- Install nozzle (see specifications);
- Confirm electrode settings;
- Make the electrical connections;
- Complete oil line connections.

### CAUTION

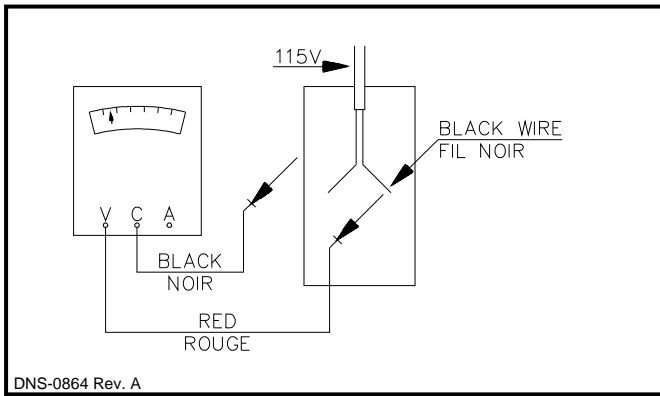
Do not fire the burner until you have checked the following:

### Checking the polarity

Oil burners used on the furnaces have solid state control systems which makes them sensitive to the proper connection of the hot and neutral power lines. The controls will be damaged if the two lines are reversed.

- Set your voltmeter to line voltage;
- Place one prong on your grounded electric entry box and one prong on the black wire;
- Read the voltage;
- If the voltage is zero, check the white wire. If line voltage shows, reverse the 115-volt leads entering the furnace junction box (see Figure 1, p. 7);
- If you do not have a voltmeter, use a pilot light.

**FIGURE 1**



**Checking the nozzle**

The burner is equipped with an appropriate size nozzle. If another size nozzle or a replacement is required, use the manufacturer's nozzle data shown in Table 2, p. 12. Note that all nozzle sizes are based on a pump pressure of 100 psi.

Always select nozzle sizes by working back from the actual desired flow rate at operating pressure, and not by the nozzle marking.

**Checking air and turbulator settings**


Before starting the burner for the first time, adjust the air and turbulator settings to those listed in Table 2, p. 12. Once the burner becomes operational, final adjustments will be necessary.

**Checking the fuel supply system**

Fuel Specifications:

**NOTE:** Use No.1 or No.2 Heating Oil (ASTM D396) or in Canada, use No.1 or No.2 Furnace Oil.

Before starting the burner be sure that the fuel tank is filled with clean oil.

 **WARNING**

**Fire and explosion hazard.**

**Use only approved heating type oil in this furnace. DO NOT USE waste oil, used motor oil, gasoline or kerosene.**

**Use of these will result in death, personal injury and/or property damage.**

**NOTE:** You may notice a slight odour the first time your furnace is operated. This will soon disappear. It is only the oil used on certain parts during manufacturing.

**1.8) BLOCKED VENT SHUT-OFF (BVSO)  
For chimney venting**

 **WARNING**

**It is imperative that this device be installed by a qualified agency.**

This device is designed to detect the insufficient evacuation of combustion gases in the event of a vent blockage. In such a case the thermal switch will shut down the oil burner. The device will then need to be re-armed MANUALLY.


Refer to the wiring diagrams and the detailed instructions supplied with the BVSO for the installation and wiring procedures. The length of wires supplied with the unit is such that the safety device must be installed between the flue outlet of the appliance and the draft regulator, as indicated in the instructions.

It is further imperative that the BVSO be maintained annually. For more details refer to the instructions supplied with the device itself, as well as Section 3.1.8 of this manual.

**CAUTION**

A positive pressure venting system (Sealed Combustion System or Direct Vent) **MUST NOT** use the BVSO. Follow the instructions supplied with the venting system.

**1.9) INSTALLING ACCESSORIES**

 **WARNING**

**Electrical shock hazard.**

**Turn OFF electric power at the fuse box or service panel before making any electrical connections and ensure a proper ground connection is made before connecting line voltage.**

**Failure to do so could result in property damage, bodily injury or death.**

**1.9.1) Air conditioning**

An air conditioning coil may be installed on the supply air side only. Also, according to the coil manufacturer's instructions, a minimum clearance of 6 inches must be allowed between the bottom of the coil drain pan, and the top of the heat exchanger. Wire the thermostat and condensing unit contactor as indicated in the wiring diagram (Figure 4, p. 14).

**1.9.2) Ductwork and Filter**

**Installation**

Design and install the air distribution system to comply with Air Conditioning Contractors of America manuals or other approved methods that conform to local codes and good trade practices.

Knockouts are provided on both sides of the furnace to cut the required size opening for the installation of the return ductwork. This can be done on either the right or the left side of the furnace. See Figure 3, p. 13 for location and dimensions.

**NOTE: THE BACK SHOULD NOT BE CUT OUT FOR RETURN AIR**

Provision is also made on this furnace for a bottom return air duct. Knockouts are provided on the floor of the furnace to facilitate the installation of the air filter rack assembly and return ductwork. (We recommend the use of this opening for horizontal installations).

### CAUTION

When ducting supplies air to a space other than where the furnace is located, the return air ducts must be sealed and also directed to the space other than where the furnace is located. Incorrect ductwork termination and sealing will create a hazardous condition which can lead to bodily harm.

Install air conditioning cooling coil (evaporator) downstream from the supply air plenum of the furnace. If a separate evaporator and blower unit is used, install good sealing dampers for air flow control. Cold air from the evaporator coil going through the furnace could cause condensation and shorten furnace life.

### CAUTION

Dampers (purchased locally) MUST be automatic.



### WARNING

**Poisonous carbon monoxide gas hazard.**

**Do NOT draw return air from inside a closet or utility room. Return air duct MUST be sealed to furnace casing.**

**Failure to properly seal duct can result in death, personal injury and/or property damage.**



### WARNING

**Poisonous carbon monoxide gas hazard.**

**Install evaporator coil on the supply side of the furnace ducting.**

**Evaporator coil installed in return side ducting can cause condensation to form inside heat exchanger resulting in heat exchanger failure. This could result in death, personal injury and/or property damage.**

## PART 2 OPERATION

### 2.1) SEQUENCE OF OPERATION

#### 2.1.1) Sequence of operation - Beckett AFG and Riello 40-F

1. Normally open contact (T-T) on primary relay closed when thermostat calls for heat;
2. AFG burner: The motor starts and spark is established. The pump pressure builds and the oil supply mechanism opens, admitting fuel to the nozzle;  
40F burner: Burner motor starts. The burner motor fan pre-purges the combustion chamber and vent for 10 seconds, establishing the combustion air pattern. During this time the solenoid valve holding coil pressure is approximately 100 psig. The solenoid valve opens, allowing oil to flow through the nozzle. At the same time, the burner motor ignition coil produces a spark;
3. Spark ignites oil droplets;
4. Cad cell senses flame and burner continues to fire. Ignition transformer ceases sparking (R40-F);
5. After Fan-Limit control heats up to the factory set point, the circulating air blower and electronic air cleaner starts;
6. The circulating air blower and burner motor remain on until the thermostat is satisfied (AFG). The ignition transformer continues to spark (AFG). The solenoid valve remains open (R40-F);  
Thermostat is satisfied :
7. Primary relay contacts open, solenoid valve closes (R40-F), burner fan motor shuts down. The ignition transformer ceases sparking (AFG);
8. The Fan-Limit control bi-metal cools down to the factory set point of 90°F (32°C), the circulating air blower stops.

### 2.2) CHECKS AND ADJUSTMENTS

#### 2.2.1) General

During initial start-up and subsequent yearly maintenance calls, the furnace must be thoroughly tested.

#### IMPORTANT

The burner must be put in operation for at least 10 minutes before any test readings are taken. For new installations, set up the burner to the settings per Table 2, p. 12 before firing. These are rough adjustments, but they will ensure that the burner will start and run smoke-free in advance of fine tuning.

Open the oil bleed port screw and start the burner. Allow the oil to flush into a container for at least 10 seconds. Slowly close and tighten the bleed screw. The oil should flow absolutely free of white streaks or bubbles to indicate that no air is being drawn into the suction side of the oil piping and pump. Fire the burner. Adjust the oil pressure as indicated in Table 2, p. 12.

#### 2.2.2) Restart after burner failure

1. Set thermostat lower than the room temperature;
2. Press the reset button on the burner primary control (relay);
3. Set thermostat higher than the room temperature;
4. If the burner motor does not start or ignition fails, turn off the disconnect switch and CALL A QUALIFIED SERVICE TECHNICIAN.

#### CAUTION

Do not attempt to start the burner when excess oil has accumulated, when the furnace is full of vapour, or when the combustion chamber is very hot.

### 2.2.3) Smoke / CO<sub>2</sub> test

1. Pierce a test hole in the smoke pipe near the furnace breech. Insert the smoke test instrument probe into the hole;
2. Starting with a zero smoke reading, gradually reduce the burner air setting until just a trace of smoke results (#1 on Bacharach Scale);
3. Take a CO<sub>2</sub> sample at the same test location where the smoke sample was taken. Note the CO<sub>2</sub> reading associated with the #1 smoke condition;
4. Adjust the burner air setting to obtain a CO<sub>2</sub> reading 1% lower than the reading associated with the #1 smoke;
5. This method of adjusting the CO<sub>2</sub> will allow adequate excess air to ensure that the burner will burn clean for the entire heating season.

### 2.2.4) Supply air adjustments (4 speed motors)

On units equipped with 4-speed blower motors, the supply air must be adjusted based on heating/air conditioning output and the static pressure of the duct system. For the desired air flow refer to the following table as well as the air flow tables based on static pressure in the Technical Specifications section of this manual, p. 12.

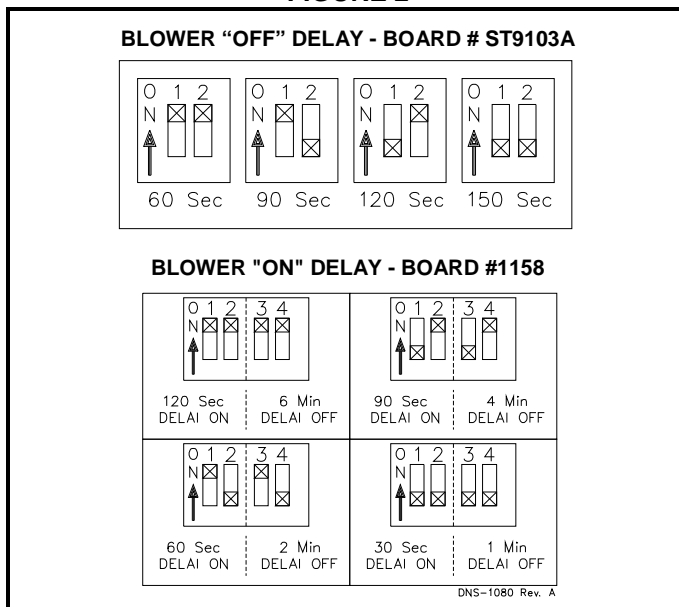
**TABLE 1**  
**BLOWER SPEED ADJUSTMENTS**  
**(4 SPEED MOTORS)**

HEATING CAPACITY	STATIC PRESSURE	RECOMMENDED BLOWER SPEED
1.20 USGPH	0.25" W.C.	MED-HIGH
	0.50" W.C.	HIGH
1.35 USGPH	0.25" W.C.	HIGH
	0.50" W.C.	HIGH
1.50 USGPH	0.25" W.C.	HIGH
	0.50" W.C.	HIGH

To effect the adjustment, the RED and BLUE wires can be changed on the motor. Also, refer to the position of the wires on the electronic board of the unit and consult the wiring diagrams. If the heating and the air conditioning speeds are the same, the RED wire must be moved to "UNUSED LEADS" on the electronic board and the jumper provided with the BLUE wire must be used between the "HEAT" and "COOL" terminals.

The blower start/stop delays can be adjusted by positioning the DIP switches on the electronic board as shown on the following figures.

**FIGURE 2**



### 2.2.5) Vent temperature test

1. Place a thermometer into the test hole located in the breech pipe;
2. The vent temperature should be between 400 and 575°F (204 and 302° C). If not, check for improper air temperature rise, pump pressure, nozzle size, or for a badly sooted heat exchanger.

### 2.2.6) Limit control check

After the furnace has been in operation for at least 15 minutes, restrict the return air supply by blocking the filters or closing the return registers and allow the furnace to shut down on High Limit. The burner will shut OFF and the main blower should continue to run.

Remove the restriction and the burner should come back on after a few minutes.

### Year round air conditioning:

The furnace is designed for use in conjunction with cooling equipment to provide year round air conditioning. The blower has been sized for both heating and cooling, however, the fan motor speed may need to be changed to obtain the necessary cooling air flow.

### Heating:

The blower speed is factory set to deliver the required airflow at normal duct static pressure.

### Cooling:

The blower speed may be adjusted in the field to deliver the required airflow, for cooling application, as outlined in Table 2.1, p. 12.

### Constant Blower Switch:

This furnace is equipped with a constant low speed blower option. Whenever the room thermostat is not calling for heating or cooling, the blower will run on low speed in order to provide air circulation. If this constant blower option is not desired, the rocker switch on the side of the control box can be used to turn off this feature.

### 2.2.7) BVSO performance test

The purpose of the following test is to check that the electrical outlet on the furnace, designated to the BVSO, is functional.

1. Start up the burner;
2. Remove the three-pole plug from the BVSO outlet on the furnace;
3. The burner must shut-off immediately, while the blower continues to run to the end of the cool-down cycle.

If the test is not in line with the above, call a QUALIFIED SERVICE TECHNICIAN.



## PART 3 MAINTENANCE

### 3.1) GENERAL

#### Preventive Maintenance

**Preventive maintenance is the best way to avoid unnecessary expense and inconvenience. Have your heating system and burner inspected at regular intervals by a qualified service technician.**

After each annual inspection of the unit, a complete combustion test must be performed to maintain optimum performance and reliability.



#### WARNING

**Electrical shock hazard.**

**Turn OFF power to furnace before any disassembly or servicing.**

**Failure to do so can result in property damage, bodily injury and/or death.**

**Do not tamper with the unit or its controls. Call a qualified service technician.**

#### Before calling for service, check the following:

- Check the oil tank gauge and check if valve is open;
- Check the fuse or circuit breaker;
- Check if the shut-off switch is "ON";
- Reset the thermostat above room temperature;
- If ignition does not occur turn off the disconnect switch and call a qualified service technician.

**When ordering replacement parts, specify the complete furnace model number and serial number.**

#### 3.1.1) Heat exchanger cleaning

Ordinarily, it is not necessary to clean the heat exchanger or flue pipe every year, but it is advisable to have a qualified oil burner serviceman check the unit before each heating season to determine whether cleaning or replacement of parts is necessary.

If cleaning is necessary, the following steps should be performed:

- Turn "OFF" all utilities upstream of the furnace;
- Disconnect the flue pipe;
- Remove the flue collar panel located at the front part of the furnace;
- Remove the radiator baffles;
- Disconnect the oil line and remove the oil burner from the furnace;
- Clean the secondary tubes, and the primary cylinder with a stiff brush and vacuum cleaner;
- After cleaning, replace the radiator baffles, flue collar plate and oil burner;
- Readjust burner for proper operation.

Soot will have collected in the first sections of the heat exchangers only if the burner was started after the combustion chamber was flooded with fuel oil, or if the burner has been operating in a severely contaminated condition.

#### 3.1.2) BLOWER REMOVAL

To remove the blower from the furnace:

- Turn "OFF" all utilities upstream of the furnace;
- Remove the burner access door and blower door;
- Remove the blower retaining screw (on the blower rail);
- Remove cover from control box and disconnect the thermostat and power wires from the board;
- Slide the blower on the rails toward the front of the unit;
- Reverse the above steps to reinstall the blower. (Refer to the wiring diagrams, Figure 4, p. 14 of this manual or the diagram located on the inside of the blower door to properly rewire the unit.)

#### CAUTION

Be sure the blower is adequately supported when sliding it off the mounting rails, especially in the horizontal configuration, in order to prevent dropping the blower and injuring yourself or damaging the blower.

#### 3.1.3) Burner drawer assembly

Remove the drawer assembly. Clean all foreign matter from the retention head and electrodes. If a Beckett AFG burner is installed, the burner will have to be removed to check the retention head.

#### 3.1.4) Nozzle

Replace the nozzle with the one specified in Table 2, p. 12.

#### 3.1.5) Oil filters

##### Tank filter

The tank filter should be replaced as required.

##### Secondary filter

The 10 micron (or finer) filter cartridges should be replaced annually.

#### 3.1.6) Air filters

Air filters are the disposable type. Disposable filters should be replaced at least once a year. Dusty conditions, presence of animal hair etc. may demand more frequent filter changes. Dirty filters will impact furnace efficiency and increase oil consumption.

#### 3.1.7) Motor lubrication

Do not lubricate the oil burner motor or the direct drive blower motor as they are permanently lubricated.

#### 3.1.8) Blocked Vent Shut Off (BVSO) Cleaning

#### CAUTION

Do not dent or scratch the surface of the thermal switch. If the thermal switch is damaged, replacement is required.

For continued safe operation, the Blocked Vent Shut-Off System (BVSO) is required to be inspected and maintained annually by a qualified agency.

1. **Disconnect power to the appliance;**
2. Remove the two screws holding on the BVSO assembly cover;
3. Remove the cover;
4. Remove the two screws holding the control box to the heat transfer tube assembly. Sliding the control box in the appropriate direction will unlock it from the heat transfer tube assembly;
5. Carefully remove any build-up from the thermal switch surface;

6. Clear and remove any build-up or obstruction inside the heat transfer tube;
7. Re-mount, lock and fasten the control box with the 2 screws removed in step 4;
8. Re-attach the assembly cover with the screws removed in step 2;
9. Re-establish power to the appliance.

## PART 4 INFORMATION

Model: \_\_\_\_\_ Serial number: \_\_\_\_\_

Furnace installation date: \_\_\_\_\_

Service telephone – Day: \_\_\_\_\_ Night: \_\_\_\_\_

Dealer name and address: \_\_\_\_\_

### START-UP TEST RESULTS

Nozzle: \_\_\_\_\_ Pressure: \_\_\_\_\_ Lb/psi

Burner adjustments: Primary air \_\_\_\_\_

Fine air \_\_\_\_\_

Draw Assembly \_\_\_\_\_

CO<sub>2</sub>: \_\_\_\_\_ % Smoke scale : \_\_\_\_\_ (Bacharach)

Gross stack temperature: \_\_\_\_\_ ° F

Ambient temperature: \_\_\_\_\_ ° F

Chimney draft: \_\_\_\_\_ " W.C.

Overfire draft: \_\_\_\_\_ " W.C.

Test performed by: \_\_\_\_\_

**TABLE 2**  
**Technical specifications, AMP300B34-SE2PMA / OTF210G21B**

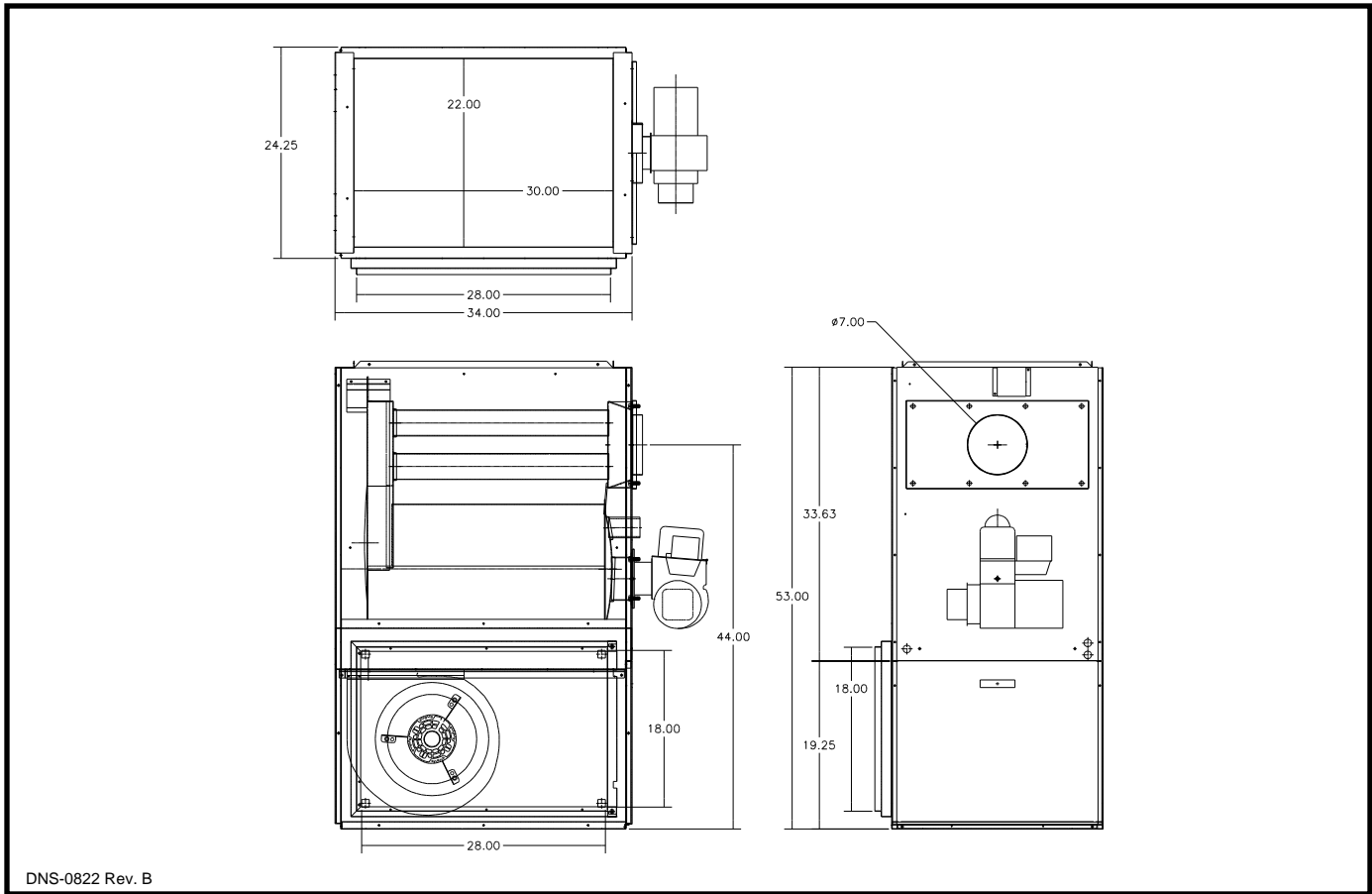
<b>RATING AND PERFORMANCE</b>			
Firing rate (USGPH)	1,20	1,35	1,50
Input (BTU/h)	168 000	189 000	210 000
Heating capacity (BTU/h)	139 000	154 000	171 000
Heating temperature rise	18 - 29°C (65 - 85°F)		
<b>BECKETT OIL BURNER (3450 RPM)</b>	<b>AFG-F6 (INSERTION TUBE 2 7/8")</b>		
Low firing rate baffle	NO		
Static disc, model	2 3/4 #3383		
Nozzle (Delavan)	1.00-80B	1.10-80B	1.25-80B
Pump pressure (PSIG)	145	150	145
Combustion air adjustment (band / shutter)	0 / 6	1 / 3	1 / 5
AFUE % (From CSA B212 standard and Canadian regulation)**	85,4%	84,4%	84,4%
AFUE % (From ASHRAE 103 standard and US regulation)**	84,1%	83,2%	83,2%
<b>RIELLO BURNER; MODEL 40</b>	<b>F5 (INSERTION TUBE 3 9/16")</b>		
Nozzle (Delavan)	1.00-70W	1.10-70W	1.25-70W
Pump pressure (PSIG)	145	150	145
Combustion air adjustment (turbulator / damper)	0 / 3	1 / 3.25	4/4
AFUE % (From CSA B212 standard and Canadian regulation)**	86,3%	85,3%	85,0%
AFUE % (From ASHRAE 103 standard and US regulation)**	85,0%	83,8%	83,2%
<b>ELECTRICAL SYSTEM</b>			
Volts - Hertz - Phase	115 - 60 - 1		
Operating voltage range	104 - 132		
Rated current (Amps)	15,7		
Minimum ampacity for wiring sizing	18,1		
Max. fuse size (Amps)	20,0		
<b>BLOWER DATA</b>			
Blower speed at 0.25" W.C. static pressure	MED-HIGH	HIGH	HIGH
Blower speed at 0.5" W.C. static pressure	HIGH	HIGH	HIGH
Motor / number of speeds	3/4 HP / 4		
Blower dimensions (in.)	120 x 10 (tight housing)		
<b>GENERAL INFORMATION</b>			
Overall W x L x H less burner	24.25" x 34" x 52.75"		
Shipping weight	250 lbs		
Filter quantity and size	(1) 20" x 30"		
Supply air duct W x H	22" x 30"		
Return air duct W x H	18" x 28"		
Maximum air conditioning capacity	5 tons		

\*\* AFUE value established after minimum 20 hours of operation.

**TABLE 2.1**  
**Air delivery – CFM with air filter**

<b>SPEED</b>	<b>AMP300B34-SE2PMA / OTF210G21B</b>	
	<b>EXTERNAL STATIC PRESSURE WITH AIR FILTER</b>	
	<b>0.25"</b>	<b>0.50"</b>
<b>MED-HI</b>	2 200	N/A
<b>HIGH</b>	2 300	2 150

**FIGURE 3**  
**Model: AMP300B34-SE2PMA / OTF210G21B**

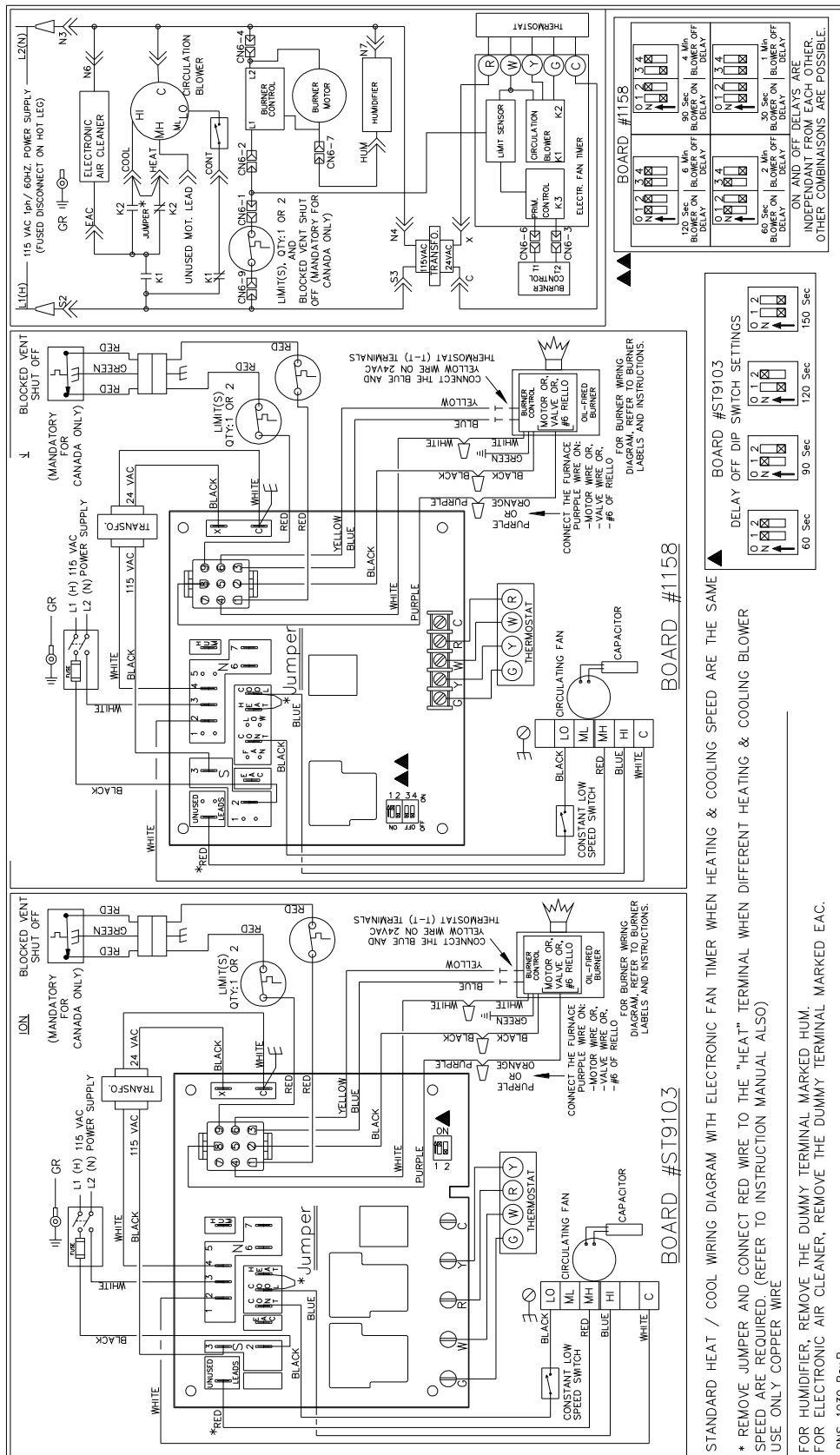


**TABLE 2.2**  
**Minimum clearances – combustible materials**

LOCATION	APPLICATION	UPFLOW	HORIZONTAL
SIDE	FURNACE	5.08 cm (2")	5.08 cm (2")
	SUPPLY PLENUM WITHIN 6 FEET OF FURNACE	2.54 cm (1")	2.54 cm (1")
BACK	FURNACE	5.08 cm (2")	5.08 cm (2")
TOP	FURNACE OR PLENUM	2.54 cm (1")	7.6 cm (3")
	HORIZONTAL WARM AIR DUCT WITHIN 6 FEET OF FURNACE	2.54 cm (1")	7.6 cm (3")
BOTTOM	FURNACE	Ø	*Ø
FLUE PIPE	HORIZONTAL OR BELOW FLUE PIPE	23 cm (9")	23 cm (9")
	VERTICALLY ABOVE FLUE PIPE	23 cm (9")	23 cm (9")
FRONT	FURNACE	61 cm (24")	61 cm (24")

\* When used with floor base model HFB-101

**FIGURE 4**  
**Wiring diagram, AMP300B34-SE2PMA / OTF210G21B**



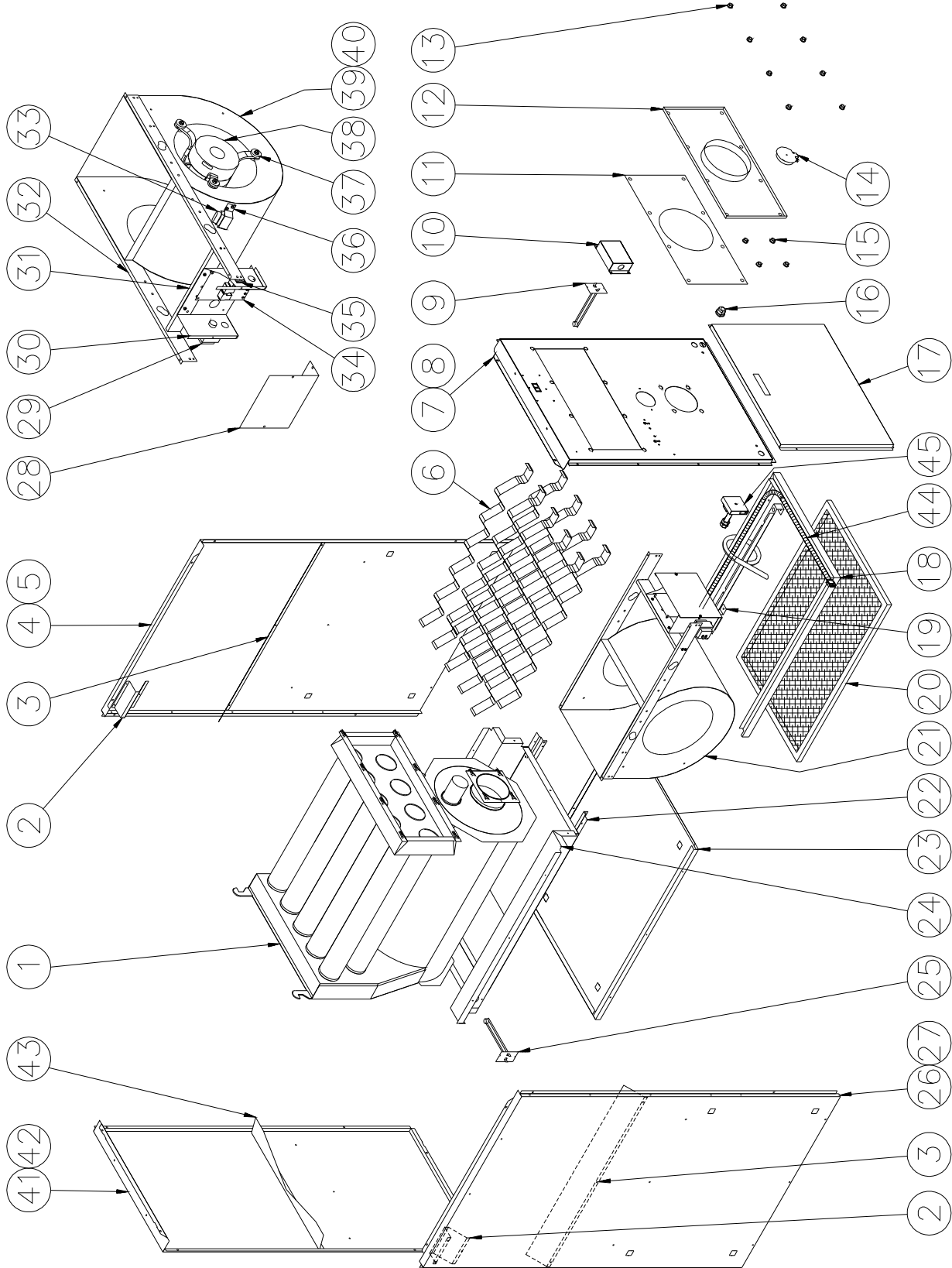
STANDARD HEAT / COOL WIRING DIAGRAM WITH ELECTRONIC FAN TIMER WHEN HEATING & COOLING SPEED ARE THE SAME

\* REMOVE JUMPER AND CONNECT RED WIRE TO THE "HEAT" TERMINAL WHEN DIFFERENT HEATING & COOLING BLOWER SPEED ARE REQUIRED. (REFER TO INSTRUCTION MANUAL ALSO)  
 USE ONLY COPPER WIRE

FOR HUMIDIFIER, REMOVE THE DUMMY TERMINAL MARKED HUM.  
 FOR ELECTRONIC AIR CLEANER, REMOVE THE DUMMY TERMINAL MARKED EAC.

DNS-1030 Rev.B

**PARTS LIST**  
**Model : AMP300B34-SE2PMA / OTF210G21B**



B50046A

**PARTS LIST**  
**Model : AMP300B34-SE2PMA / OTF210G21B8**

ITEM	PART #	DESCRIPTION
1	B02800	Heat exchanger assembly
2	B02823	Heat exchanger support
3	B02824	Side baffle
4	B02791-01	Right side panel assembly
5	B02815	Side panel insulation
6	B02808	Heat exchanger baffles
7	B02786-06	Front panel assembly
8	B02817	Front panel insulation
9	R02R004	High temp. control 195-30F, 7"
10	B03355	High temp. control cover
11	B02714	Gasket, breech plate
12	B02799	Breech plate, 7"
13	F07O001	Hexagonal nut 3/8-16 NC brass
14	B02111	Observation door assembly
15	F07F011	Hexagonal nut 3/8-16 NC zinc
16	L04I011	Strain relief bushing
17	B02787-05	Blower door assembly
18	B01809	Filter rack U frame
19	B01808	Filter rack access
20	Z04F013	Paper filter 20" x 30" x 1"
21	B01406-01	Blower assembly complete
22	B01794	Blower slide
23	B02820	Floor
24	B02830	Divider panel assembly
25	R02R002	High temp. control 140-20F, 7"
26	B02791-02	Left side panel assembly
27	B02815	Side panel insulation
28	B01684	Electric box cover
29	L01F009	Transformer 120/24 VAC
30	B01683	Electrical box complete
31	B01682	Electrical box holder plate
32	B01681	Blower slide
33	L01I005	15 MF Capacitor
34A	R99G004	Electronic fan timer 1158-110
34B	B02797	Electrical wire kit
35	L07F003	Rocker switch SPST
36	B01024	Capacitor holder
37	B01889	Motor mount assembly
38	L06I004	3/4 hp direct drive motor, 4SD
39	B03720-05	Blower 120-10T DD
40	Z01L003	Blower wheel 120 x 10 DD
41	B02792	Back panel assembly
42	B02813	Back panel insulation
43	B02825	Rear baffle
44	B03118-01	Elect. Kit for BVSO (ext.)
45	Z06G001	Blocked vent shut-off BVSO-225