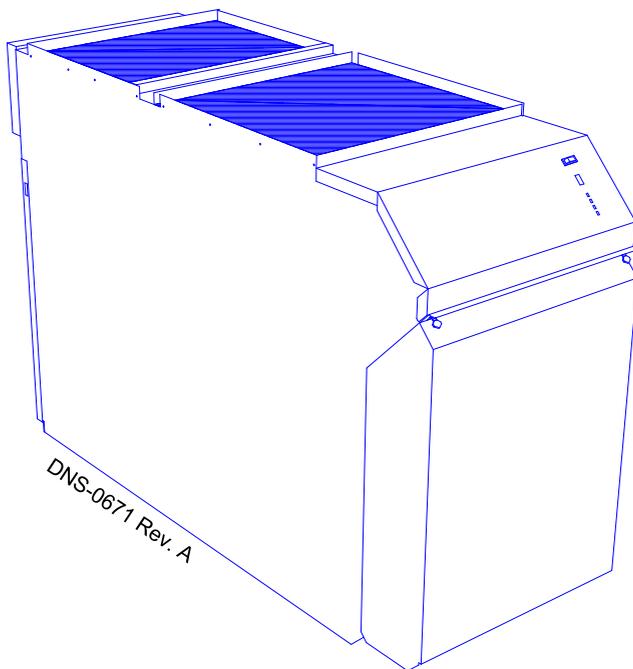


Installation Instructions and Homeowner's Manual

OIL FIRED FURNACE DUAL ENERGY - LOW-BOY



DNS-0671 Rev. A

INSTALLER / SERVICE TECHNICIAN:

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

HOMEOWNER:

PLEASE KEEP THIS MANUAL NEAR THE FURNACE FOR FUTURE REFERENCE.

Models:

AME15-79

AME20-90

AME25-100



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

Manufactured by:

Industries Dettson inc.

3400 Industrial Boulevard
Sherbrooke, Quebec - Canada - J1L 1V8
www.dettson.ca

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1.0 SAFETY REGULATIONS

FOR YOUR SAFETY

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

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.

1.1 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 bodily and/or material damage.



WARNING

Hazards or unsafe practices which **CAN** result in death or serious bodily and /or material damage.



CAUTION

Hazards or unsafe practices which **CAN** result in minor bodily and /or material damage.

1.2 IMPORTANT INFORMATION



WARNING

For use with grade 2 fuel oil maximum. Do **NOT** use gasoline, crankcase oil or any oil containing gasoline.



WARNING

Never burn garbage or paper in the heating system and never leave rags or paper around the unit.



CAUTION

These instructions are intended for the sole use of qualified personnel trained in installing this type of furnace. Installation of this furnace by an unqualified person can lead to hazardous conditions, resulting in bodily harm and/or equipment damage.

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

Only the latest issues of the above codes should be used, and are available from either:

The National Fire Protection Agency
Batterymarch Park
Quincy, MA 02269

or

The Canadian Standards Association
178 Rexdale Blvd.
Rexdale, Ontario M9W 1R3



CAUTION

ENVIRONMENTAL HAZARD

Failure to follow this caution may result in environmental pollution.

Remove and recycle all components or materials (i.e. oil, electrical and electronic components, insulation, etc.) before unit final disposal.

2.0 INSTALLATION

2.1 GENERAL

This furnace is a Low-Boy and operates only in an upflow configuration.

The appliance is shipped as a packaged unit, complete with burner and controls. It requires a line voltage connection to the control box (240/120 VAC, 60Hz with 3 wires plus ground), thermostat hook-up as shown on the wiring diagram, oil line connection(s), proper ductwork, and connection to a properly sized vent.

The air handling capacity of this furnace is designed for cooling air flow. Refer to Table 3 for the expected airflow at various external duct static pressures.

IMPORTANT: If sidewall venting is **not** used at the time of the installation, place a jumper between terminals # 2 and # 3.

2.2 POSITIONING THE FURNACE

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



WARNING

This furnace is not watertight and is not designed for outdoor installation. It shall be installed in such a manner as to protect the electrical components from water. Outdoor installation will lead to a hazardous electrical condition and to premature furnace failure.

This furnace is approved for reduced clearances to combustible construction. This unit may be located in a basement or on the same level as the area to be heated. In any case, the unit should always be installed level.

If the unit is installed in a basement, or on a floor (as in a crawlspace), it is recommended that it be installed on a concrete pad that is 25 to 50 mm (1 to 2") thick.

The minimum required clearances for this furnace are specified in Table 4.

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

2.2.1 Combustion air and ventilation

Refer to the CAN/CSA-B139 installation code for complete regulations and for guidance on retrofit applications.

This furnace should be installed in a location where air supply permits proper combustion of the oil, proper venting and the maintenance of an ambient temperature at safe limits under normal conditions of use. The location should not interfere with proper circulation of air within the confined space.

In addition to the air needed for combustion, process air shall be provided as required for cooling of equipment or material, controlling the dew point, heating, drying, oxidation or dilution, safety exhaust, odour control, for ventilation, including all air required for comfort and proper working conditions for the occupants.



WARNING

Do not block the combustion air openings in the furnace. Any blockage will result in improper combustion and may result in a fire hazard and/or cause bodily harm.

The barometric draft regulator shall be installed in the same room or enclosure as the furnace in such a manner as to prevent any difference in pressure between the regulator and the combustion air supply.

Air requirements for the operation of exhaust fans, kitchen ventilation systems, clothes dryers, and fireplaces shall be considered in determining the adequacy of a space to meet such combustion air requirements.

In unconfined spaces, in buildings of conventional frame, brick or stone construction, infiltration may be adequate to provide air for combustion, ventilation and dilution of flue gases. This determination must be made on an individual installation basis and must take into consideration the overall volume of the unconfined space, the number of windows and ventilation openings, the number of doors to the outside, internal doors which can close off the unconfined space and the overall tightness of the building construction.

Many new buildings and homes and older ones that have been weatherized, must be considered as being of tight construction and, therefore, infiltration will not be sufficient to supply the necessary air for combustion and ventilation.

A building can be considered as being of tight construction when:

- Walls and ceilings exposed to the outside atmosphere have a continuous water vapor retarder, with a rating of one perm or less, with sealed openings and/or
- Weather-stripping has been added on operable windows and doors, and/or
- Caulking or sealant are applied to areas such as joints around windows and door frames, between sole plates and floors, between wall-ceiling joints, between wall panels, at penetration points for plumbing, electrical and fuel lines and at other openings.

2.2.2 Duct recommendations

The proper sizing of warm air ducts is necessary to insure satisfactory furnace operation. Ductwork should be in accordance with the latest editions of NFPA-90A (Installation of Air Conditioning and Ventilating Systems) and NFPA-90B (Warm Air Heating and Air Conditioning Systems) or Canadian equivalent.

The supply ductwork should be attached to the flanged front opening provided at the discharge end of the furnace and return air ductwork should be attached to the flanged rear opening of the furnace. See Figure 2 for the dimensions of this opening.

The following recommendations should be followed when installing ductwork:

- Install locking type dampers in all branches of the individual ducts to balance out the system. Dampers should be adjusted to impose the proper static pressure at the outlet of the furnace.
- A flexible duct connector of noncombustible material should be installed on the unit on both the supply and return air system. In applications where extremely quiet operation is necessary, the first 3 meters (10') of supply and return ducts should be internally lined with acoustical material.
- In cases where the return air grille is located close to the fan inlet, there should be at least one 90° air turn between fan inlet and grille. Further reduction in sound level can be accomplished by installing acoustical air turning vanes or lining the duct as described in paragraph b. above.
- When a single air grille is used, the duct between grille and furnace must be the same size as the return opening in the furnace.



CAUTION

Return air grilles and warm air registers must not be obstructed.



WARNING

When ducting supplies air to a space other than where the furnace is located, the return air ducts must be sealed and also be 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.

2.2.3 Venting instructions

Venting of the furnace should be to the outside, 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 an "L" type vent; maximum flue gas temperature 302 °C (575 °F).

Pre-Installation Vent System Inspection

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

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

- Inspection for any deterioration of 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 cleared 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 in Section 1.)

Masonry Chimneys

This furnace can be vented into an existing masonry chimney. It 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 and/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 for 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;
- The flue pipe can be 13 to 15 cm (5 or 6") in diameter respectively;
- All pipes are supported using the proper clamps and/or straps. These supports should be installed at least every 1.2 m (4');
- All horizontal runs of pipe should have a slope of at least 2 cm per 1 m (1/4" per foot);
- 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 0.9 m (3') above the highest point where it passes through a roof of a building and at least 0.6 m (2') higher than any portion of a building within a horizontal distance of 3 m (10'). It shall also be extended at least 1.5 m (5') above the highest connected equipment flue collar;
- Check local codes for any variances.

Factory Built Chimneys

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

2.2.4 Oil burner

This furnace is supplied with a high pressure atomizing retention head type burner, for use with not heavier than grade 2 Fuel Oil. The burner model is a Beckett AFG, the mounting flange is fixed to the burner air tube and no adjustment is required for insertion length.



CAUTION

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

Oil Connections

Complete instructions for installation of the fuel oil piping will be found in the oil burner installation instructions included with the furnace.

Openings for the oil line have been machined on the side panels. Two holes are provided in each location, so that a two-pipe system may be installed if desired.

A 10 (or less) micron oil filter should be used with all oil burners and installed as closely as possible to the burner.

Barometric Draft Control

A barometric draft control must be used with the furnace to ensure proper operation. Installation instructions are supplied with the control.

2.2.5 Electrical

The appliance must be installed in accordance with current ANSI/NFPA 70 National Electrical Code / CSA C22.1 Canadian Electrical Code Part 1 and/or local codes.

Check your furnace's power and nominal amperage in order to select the correct breaker. The appliance requires a 240/120-VAC, 60-Hz power supply connected with a three-wire cable plus ground to the terminal block provided in the upper left-hand corner of the electrical panel. The block is designed for wires ranging in size from #6 to #3/0; the ground wire must be connected to the appropriate screw on the block. Use only copper wire listed for temperatures not less than 90°C (194°F). To determine the size of wire, consult Code C22.1. Table 1 provides electrical information for your furnace.

Table 1 : Electrical characteristics

Model	Electrical power (kW)	Number of elements	Amperage (A)
AME-15-79	15	3	70.5
AME-20-90	20	4	91.3
AME-25-100	25	5	113.2

A separate line voltage supply should be used with fused disconnect switch or circuit breaker between the main power panel and the unit.

WARNING

The unit cabinet must have an uninterrupted or unbroken electrical ground to minimize personal injury if an electrical fault should occur. A green ground screw is provided in the control box for this connection.

Metallic conduit (where required/used) may terminate at the side panel of the unit. It is not necessary to extend the conduit inside the unit from the side panel to the control box.

When replacing any original furnace wiring, use only 105°C, 16 AWG copper wire.

Instructions for wiring the thermostat are enclosed in the thermostat box (field supplied). Make the thermostat connections as shown in Figure 6.

When installing optional accessories on this appliance, follow the manufacturer's installation instructions included with the accessory. Other than wiring for the thermostat, wire with a minimum of type "T" insulation (35°C, 63°F rise) must be used for accessories.

2.2.6 Air filter

WARNING

Do not use this furnace as a construction heater. Use of this furnace as a construction heater exposes it to abnormal conditions, contaminated combustion air and the lack of air filters. Failure to follow this warning can lead to premature furnace failure and/or vent failure which could result in a fire hazard and/or bodily harm.

An internal filter rack, located in the blower compartment, is provided as standard equipment with this furnace. A sufficient clearance should be provided for air filter access. Refer to Table 2 for filter rack flange dimensions for the return air duct.

2.2.7 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 4 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.

3.0 OPERATION

3.1 GENERAL

Important notice concerning the initial start-up

On the initial start-up of the unit, or after a power failure, the first heating cycle is always in the oil mode, even if the 3 position selector or the Hydro signal indicates otherwise. If there is a call for heat on power up, the heating mode will always use oil for the first heating cycle. Once the thermostat is satisfied and the first heating cycle is completed, the furnace micro processor will evaluate the heating factors (position of the selector and Hydro signal) and will decide which heating mode should be operational. If the thermostat is not calling for heat on power up, this first cycle particularity will be inoperative and the furnace will function normally later during the first heating cycle.

3.1.1 Operation in the OIL mode

When the three-position selector is on the OIL setting, the furnace operates like a conventional oil-fired appliance. When the thermostat is set high enough, the burner comes on, followed by the fan once the proper temperature is reached. Once the set room temperature is reached, the burner shuts down; the fan continues to work until residual heat is evacuated from the system. The furnace features a

built-in High-Limit Control that prevents the burner from overheating and damaging the furnace.

3.1.2 Operation in the ELECTRICITY mode:

When the three-position selector is on the ELECTRICITY setting, the furnace operates like a conventional electric warm-air furnace. When the thermostat is set high enough, the fan comes on, followed by each of the elements in sequence. When the call-for-heat has been met, the elements go off-line sequentially, while the fan stays on until residual heat is evacuated from the system. Each of the elements is individually protected from overheating by way of a Temperature Limit Control in the event of fan failure. A removable panel under the oil burner provides easy access to the electric elements.

Warm air from your furnace will naturally be cooler in the electrical than the oil mode since the electrical output is 5 kW lower. It is imperative that airflow adjustments be made in the oil mode where it is most critical. Once the call-for-heat has ended, the elements go off-line sequentially, separated by a 12 second delay.

When switching from oil to electricity, there is a five-minute delay between burner shutdown and the elements coming on-line in order to guard against overheating.

3.1.3 Operation in DUAL-ENERGY mode

When the three-position selector is on the DUAL-ENERGY setting, the furnace micro processor is on-line with Hydro. When the call-for-heat comes through, the processor determines whether to heat with oil or electricity. The electronic control system can also switch the furnace from one mode to the other during a heating cycle. It is important to note that there is a five minute delay between burner shut down and the elements coming on.

3.1.4 Operation in AUTO-RELIEF mode

A factory-installed thermosensor, located on the left side of the inside top portion of the component panel, relays temperature readings to the board. The sensor requires no adjustment or modification. If, during a period of 15 consecutive minutes, the sensor records temperatures under 38°C (100°F) while the thermostat circuit is closed, the board will assess an abnormal operation and implement auto-relief. In basic terms, this means simply changing the heating mode.

When the AUTO-RELIEF indicator light comes on, the furnace has detected a problem with one energy source and has automatically shifted to the other. If the furnace is operating electrically, with both the AUTO-RELIEF and ELECTRIC lights on, there is a burner problem. If the furnace is in the oil mode, with both the AUTO-RELIEF and OIL lights on, there is a problem with the electrical system.

Twelve hours following detection of AUTO-RELIEF, the furnace will try once again to operate with the power source indicated on the three-position switch: oil, electricity, or dual-energy, according to the signal from Hydro. The process will repeat itself every twelve hours. Obviously, if the problem persists, the furnace will remain in the AUTO-RELIEF mode. The only way to get out of this mode, in such a situation, is to manually reset the furnace by cutting and then restoring the main power supply.

3.1.5 Monitor Lights

These lights, which indicate the operating state of the furnace, are located just below the three-position selector on the outside of the electrical compartment door.

OIL light alone

This indicates that the furnace is operating on OIL solely and is not in the dual-energy mode.

OIL light with DUAL-ENERGY light

This indicates that the appliance is in the DUAL-ENERGY mode, but operating on OIL at the moment.

ELECTRICITY light alone

This indicates that the furnace is operating solely on ELECTRICITY and is not in the dual-energy mode.

ELECTRICITY and DUAL-ENERGY lights

This indicates that the appliance is in the DUAL-ENERGY mode, but operating on electricity at the moment.

AUTO-RELIEF and OIL lights

When both these lights are on, there is a problem with the ELECTRICITY mode. The dual-energy light may or may not be on.

AUTO-RELIEF and ELECTRICITY lights

When both these lights are on, there is a problem with the OIL system. The dual-energy light may or may not be on.

3.1.6 Operating in the EMERGENCY mode

In the case of an electronic board malfunction or breakdown, the emergency mode enables the furnace to run on OIL, by using the emergency switch located between the thermostat connection terminal strip and the ventilation switch in the burner cabinet. When the thermostat calls for heat, the burner is energized and the blower is controlled by the Fan-Limit Control.



WARNING

The transfer to the emergency mode is not automatic, but must be effected manually, as required. The EMERGENCY MODE must only be used as a temporary means of heating. The problem that caused the activation of this mode in the first place must be repaired as soon as possible. For further details see Part 4 of this manual.

3.2 OPERATING IN THE OIL MODE

3.2.1 Operational checklist

Before starting up the unit, be sure to check that the following items are in compliance:

1. The electrical installation, the oil supply system, the venting system, combustion air supply and ventilation;
2. The blower access door secured in place;

3. The Blocked Vent Shut-Off (BVSO) is installed according to instructions (for chimney venting);
4. The oil supply valve is open;
5. The flame observation door (located in front of the unit) is well closed;
6. The burner "Reset" button is well pushed in or re-armed;
7. The preliminary air adjustments on the burner comply with the technical specifications in this manual;
8. The blower speed adjustments are appropriate and according to the specifications in this manual;
9. The thermostat of the room is in the heating mode and is set higher than the ambient temperature.

To start the unit, turn the main electrical switch on.



CAUTION

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

3.2.2 Purging the oil line

1. A 10-micron (or less) oil filter should be installed as closely to the burner as possible with all oil burners, but it is essential for burners with a low firing rate. We recommend the use of a low pressure drop oil filter with a capacity greater than that of the fuel pump;
2. On a new installation, the air trapped in the oil line leading from the tank to the nozzle must be thoroughly purged in order to prevent excessive after drip. The oil pump is equipped with a special fitting that facilitates the purging of any air between it and the tank. The proper procedure for performing this operation is as follows:
 - a. Place a piece of 1/4" diameter clear plastic tubing over the purge fitting on the oil pump;
 - b. Start the oil burner, then open the purge fitting and allow the burner to run until the purge tube is completely free of air bubbles;
 - c. At this point tighten the purge fitting, which will allow the oil to run to the nozzle and fire the burner. If the purging takes longer than 15 seconds and no flame has been established the burner will stop. Push the reset button on top of the Primary Control to restart the burner.

For detailed information on the operation of the Primary Control please refer to the instructions included with the furnace or the burner.

3.2.3 Combustion check

IMPORTANT: The heat exchanger metal surfaces may have oil and the baffle insulation also contains binders. These products will burn or evaporate when the unit operates for the first time. Because of this, the smoke reading may be inexact during the first minutes of operation. Therefore, the unit must operate during at least 60 minutes before taking any readings to adjust the combustion quality. Let the unit cool down before making any adjustments.

IMPORTANT: The combustion check verification **MUST** be performed after the nozzle replacement or the burner cleaning. After these manipulations, the combustion parameters are necessarily modified. Refer also to the burner instruction manual.

In order to obtain optimum performance from the oil burner, the following set-up procedures must be followed by referring to the Technical Specifications, Table 2 in this manual:

1. A test kit to measure the smoke, flue draft and over-fire pressure should be used in order to obtain the proper air band setting. Although all of the above measurements are required for optimum set up and efficiency, the most important reading that must be taken is the smoke number in the flue pipe, downstream from the regulator;
2. The proper smoke number, as established by way of engineering tests, is between 0 and 1. This degree of smoke emission is commonly referred to as a "trace". It is recommended that a Bacharach True Spot Smoke Test kit or equivalent be used;
3. Follow the next steps to do the combustion check verification:
 - a. Drill a minimum proper diameter (about 9/32") test hole in the flue pipe, approximately 18 inches from the furnace breach;
 - b. From a cold start, let the unit operate for about 5 minutes;
 - c. Set the burner air setting until you have between 0 and 1 on the Bacharach Scale (or a "trace");
 - d. Take a CO₂ sample at the same test location where the smoke reading was taken and make note of it;
 - e. Adjust the burner air setting to obtain a CO₂ reading 1.5% lower (or a O₂ reading 2.0% higher) than the reading associated with the "trace" of smoke;
 - f. This method of adjusting the burner will result in clean combustion (Bacharach smoke scale between 0 and a trace) and ensure the proper functioning of the system.
4. A barometric draft regulator, supplied with the furnace, must be installed, in order to ensure proper draft through the furnace. The barometric damper must be mounted with the hinge pins in a horizontal position and the face of the damper vertical for proper functioning, (see instructions included with damper). After the furnace has been firing for at least five minutes, the draft regulator should be set to between -0.025" W.C. and -0.035" W.C.;
5. The over fire pressure that is taken through the observation door located in the centre of the front panel above the burner is a measurement that is necessary to determine if there is a blockage in the heat exchanger or the flue pipe. Please refer to the Technical Specifications in this manual for over fire pressure values. A high pressure condition may be caused by excessive combustion air due to the air band being too wide open or a lack of flue draft (chimney effect) or some other blockage, such as soot in the secondary section of the heat exchanger or the use of an oversize nozzle input or high pressure pump;
6. After all the set up procedures mentioned above have been completed, the burner should be fired and an inspection mirror should be used to observe the flame pattern at the tip of the nozzle. Any irregularities such as burning to one side or pulsating flame patterns should be corrected by changing the nozzle.

3.2.4 Fan adjustment check

This furnace is equipped with a 4 speed direct drive motor to

deliver a temperature rise within the range specified on the rating plate, between the return and supply pressure at the external duct static pressure noted on the rating label.

Adjust the fan speed ACCORDING TO THE OIL INPUT SELECTED, so that the temperature rise is within the range specified on the rating plate (see Table 2). Consult the wiring diagram for speed changes on the direct drive motor.

In the oil mode, the blower start / stop is controlled by a helical bi-metal Fan-Limit Control, which is adjusted to start at 110°F and stop at 90°F. These are factory set limits and must not be changed or tampered with.

3.2.5 Limit Control check

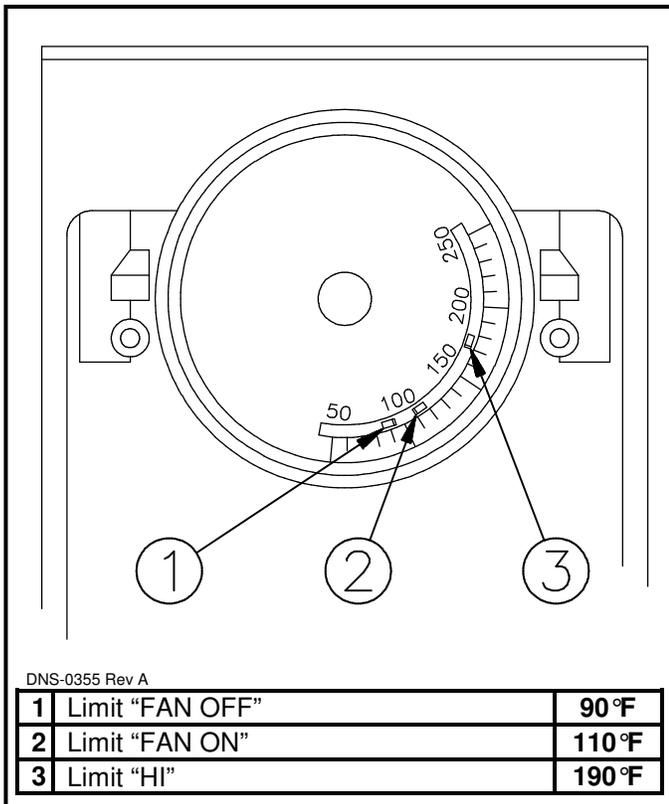
The Limit Control is factory adjusted according to Figure 1. After the furnace has been in operation for at least 15 minutes, restrict the return air supply by blocking the filters or closing the return registers and allow the furnace to shut down on high limit. The burner will shut OFF and the main blower should continue to run.

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

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.

Figure 1 : Limit Control adjustment



3.2.6 Limit Control adjustment

Changing the Low Limit "FAN ON" and limit "HI" on the Fan limit control can cause malfunction of the furnace and cause premature wear of the heat exchanger.

⚠ CAUTION

Modification of the factory set limits will void the warranty.

3.2.7 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.

4.0 MAINTENANCE

This furnace should never be operated without an air filter. Disposable filters should be replaced at least once a year. If equipped to provide cooling, filters should be replaced a minimum of twice a year.

In order to avoid injuries, be sure to cut the power to the unit before commencing maintenance work.

For optimum performance, the oil burner nozzle should be replaced at least once a year. Contact an authorized service technician if you are unsure of this procedure.

The procedure for the installation and/or replacement of a nozzle is outlined in the oil burner instruction manual that is supplied with the furnace.

After replacing the nozzle, the burner should be adjusted in accordance with the "COMBUSTION CHECK" section of this manual.

⚠ WARNING

Be sure to turn all power "OFF" upstream from the unit when servicing the furnace, unless power is required for specific operations. Failure to comply with this CAUTION can result in bodily harm and/or cause a fire hazard.

4.1 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 service technician check the unit before each heating season to determine whether cleaning or replacement of parts is required.

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

1. Turn "OFF" all power upstream from the furnace;
2. Disconnect the flue pipe and breach plate. On Sealed Combustion Systems (SCS) do not disconnect the flue pipe, only remove the breach plate;
3. Remove the radiator baffle;
4. Disconnect the oil line and remove the oil burner from the furnace;
5. Clean the secondary tubes and the primary cylinder with a stiff brush and remove debris with a vacuum cleaner;
6. Before reassembling the furnace, the heat exchanger and combustion chamber should be inspected to determine if replacement is required;
7. After cleaning, replace the radiator baffle, flue collar plate and oil burner;
8. Readjust burner for proper operation.

4.2 BLOWER REMOVAL

To remove the blower from the furnace:

1. Turn "OFF" all power upstream of the furnace;
2. Remove blower access door;
3. Remove the 4 blower retaining wing-nuts;
4. Slide the blower forward on the rails toward the rear of the unit;
5. Reverse the above steps to reinstall the blower. (Refer to wiring diagram Figure 6 of this Instruction Manual or the diagram located on the inside of the blower door to properly rewire the unit.

4.3 ACCESS TO ELEMENT DRAWER

Follow the procedure outlined below to remove the element drawer to investigate suspected element problems:

1. Disconnect the 240-VAC power supply;
2. Remove the burner compartment access panel;
3. Remove the wiring duct (2 screws) located on the right at the bottom of the burner compartment;
4. Remove the element access panel, located under the burner (6 screws);
5. Carefully pull out the drawer;
6. Remove the drawer from the furnace;
7. Remove the heat shield.

Now that the drawer is out of the furnace, you can visually inspect or test each element with a voltmeter. To replace an element, follow the steps below:

1. Disconnect the 2 wires attached to the element;
2. Remove the metal screws that hold the frame on the drawer (bottom of the drawer);

3. Remove the frame by unscrewing the necessary metal screws;
4. Check and/or replace the element.

Only Original Equipment Manufacturer replacement parts may be used. Figure 5 shows the removal procedure. Reverse the procedure to install the replacement part.

4.4 TEMPERATURE SENSOR

If the temperature sensor needs to be checked due to repetitive auto-relief without apparent reason, immerse the sensor into water at 100°C (212°F) or at 0°C (32°F). An L.E.D. located at the bottom of the card will blink at 100°C (212°F) or it will be on constantly at 0°C (32°F). At any other temperature it should remain off. If such is not the case, the card needs to be calibrated. Call a qualified technician.

4.5 BLOCKED VENT SHUT OFF (BVSO) CLEANING

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

 **WARNING**

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Disconnect electrical power supply to the furnace before servicing the blocked vent shut-off.

1. Remove the two screws holding down the BVSO assembly cover;
2. Remove the cover;
3. 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;
4. Carefully remove any build-up from the thermal switch surface;

 **CAUTION**

Do not dent or scratch the surface of the thermal switch. If the thermal switch is damaged, it must be replaced.

5. Clear and remove any build-up or obstruction inside the heat transfer tube;
6. Re-mount, lock and fasten the control box with the 2 screws removed in step 3;
7. Re-attach the assembly cover with the screws removed in step 1;
8. Re-establish power to the appliance.

5.0 FURNACE INFORMATION

Model: _____ Serial number: _____

Furnace installation date: _____

Service telephone #-Day: _____ Night: _____

Dealer name and address: _____

START-UP RESULTS

Nozzle: _____ Pressure: _____ lb/po²

Burner adjustments: Primary air _____

Fine air _____

Drawer Assembly _____

CO₂: _____ % Smoke scale: _____ (Bacharach)

Gross stack temperature: _____ °F

Ambient temperature: _____ °F

Chimney draft : _____ " W.C.

Overfire draft : _____ " W.C.

Test performed by: _____

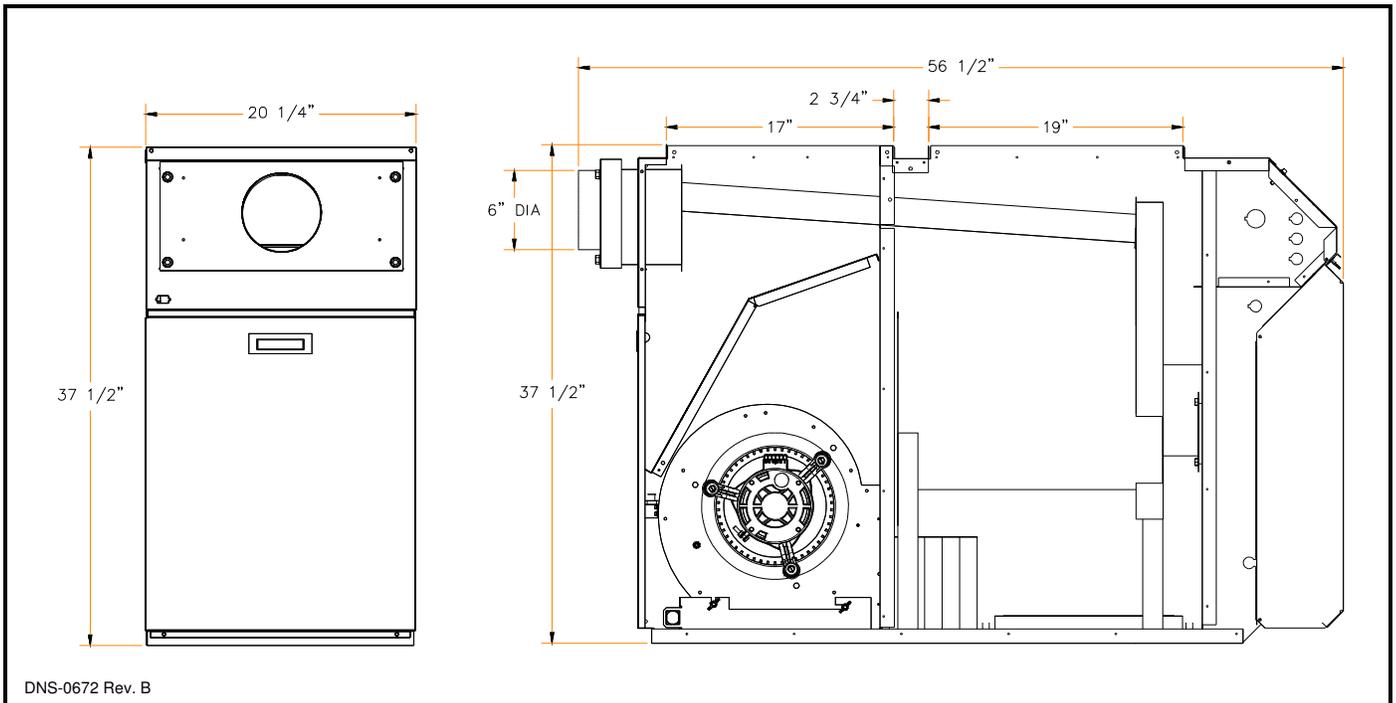
Table 2 : Technical specifications

Model : AME	15 - 79	20 - 90	25 - 100
RATING AND PERFORMANCE (OIL HEATING)			
Firing rate (USGPH)	0.65	0.75	0.85
Input (BTU/h)	91 000	105 000	119 000
Heating capacity (BTU/h)	77 000	89 000	101 000
Heating temperature rise	24°C (75°F)	27°C (80°F)	29°C (85°F)
RATING AND PERFORMANCE (ELECTRICAL HEATING)			
Input Kw (Btu/h)	15 (51,180)	20 (68,240)	25 (85,300)
Heating temperature rise	13°C (55°F)	18°C (65°F)	24°C (75°F)
Element quantity	3	4	5
Rated current (Amps)	71	91	113
BECKETT BURNER; MODEL AFG (3450 rpm)	AFG-F3		
Low firing rate baffle	YES	YES	NON
Static disc, model	2 3/4" # 3383		
Nozzle - 100 PSIG pump pressure (Delavan)	0.65 - 80W	0.75 - 80W	0.85 - 80W
Combustion air adjustment (shutter/band)	0 / 7	1 / 4	0 / 9
ELECTRICAL SYSTEM			
Volts - Hertz - Phase	240 / 120 - 60 - 1		
Control transformer	40 VA		
BLOWER DATA			
Blower speed at 0.50" W.C. static pressure	MED-HIGH	HIGH	HIGH
Blower speed at 0.20" W.C. static pressure	MED-LOW	MED-HIGH	MED-HIGH
Motor (HP) / number of speeds	1/3 HP / 4 speeds		
Blower wheel size (in.)	10 X 10		
GENERAL INFORMATION			
Overall dimensions (width x depth x height) inches	20,25 x 56,50 x 37,50		
Supply air opening (in)	17 x 20		
Return air opening (in)	19 x 20		
Filter quantity and size (in)	(1) 16 x 20 and (1) 10 x 20		
Shipping weight	215 Lbs		
Air conditioning, maximum output	3 tons		

Table 3 : Air delivery - CFM with air filter

SPEED	AME	
	EXTERNAL STATIC PRESSURE WITH AIR FILTER	
	0.2"	0.5"
HIGH	1300	1200
MED-HIGH	1200	1000
MED-LOW	1000	900
LOW	850	825

Figure 2 : AME Model



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Table 4 : Minimum clearances - combustibile materials

LOCATION	APPLICATION	MINIMUM CLEARANCES
SIDES	FURNACE	15 cm (6")
	SUPPLY PLENUM	5 cm (2")
OTHER SIDE	FURNACE	60 cm (24")
BACK	FURNACE	60 cm (24")
TOP	FURNACE OR PLENUM	5 cm (2")
BOTTOM	FURNACE (COMBUSTIBLE FLOOR)	∅
FLUE PIPE	AROUND	23 cm (9")
FRONT	FURNACE	60 cm (24")

Figure 3 : Location of main components

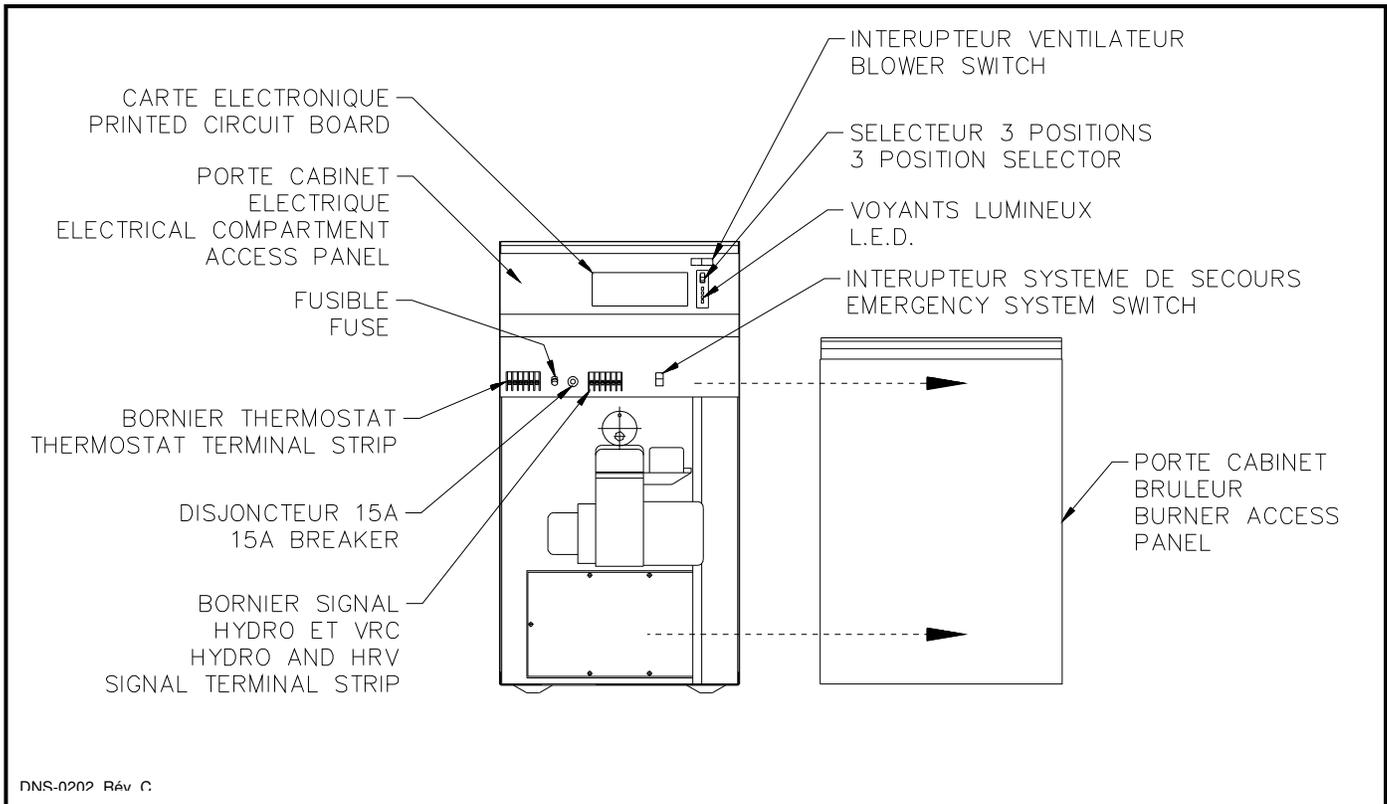


Figure 4 : Location of element drawer

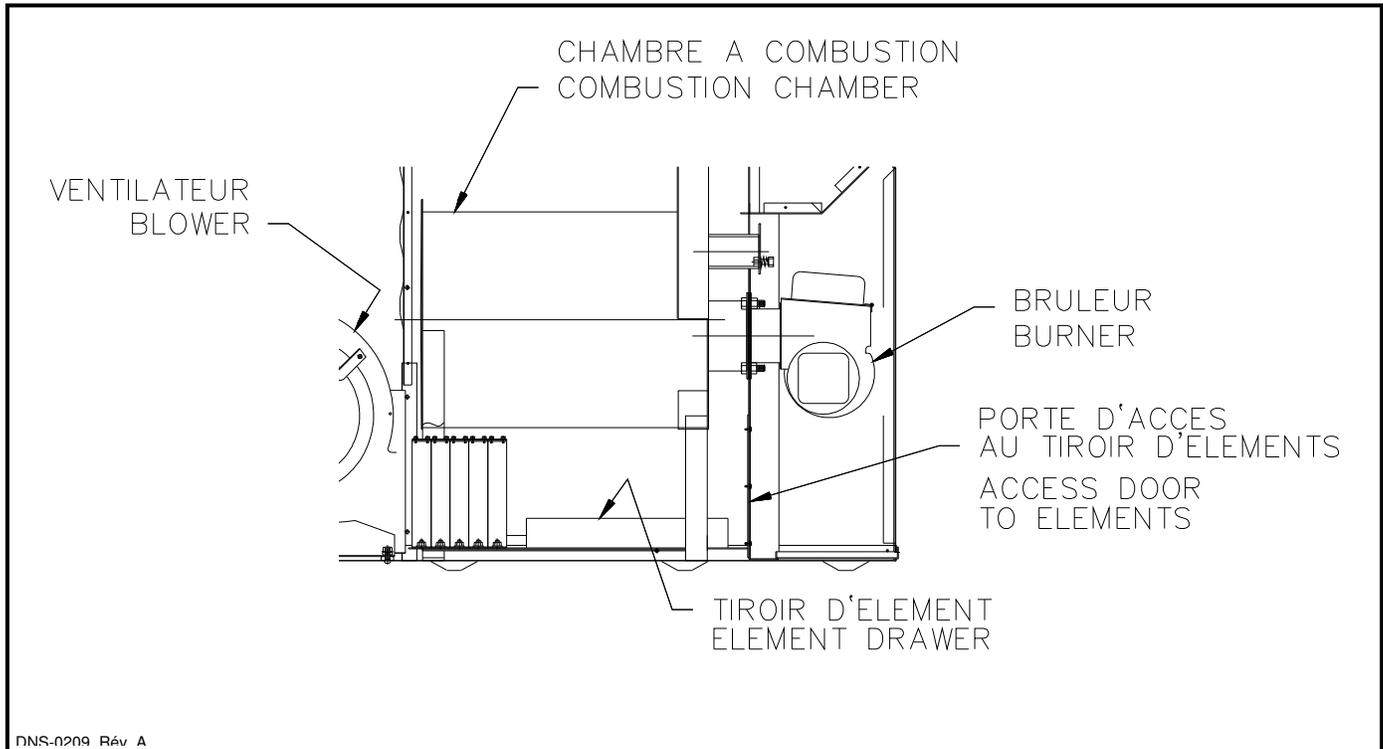
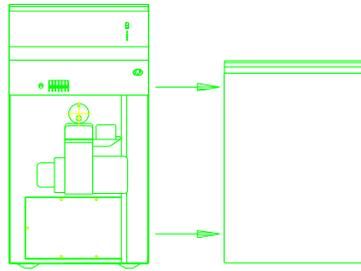
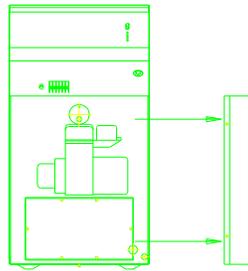


Figure 5 : Element drawer removal



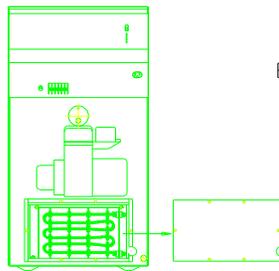
ETAPE #1 ENLEVER LA PORTE
D'ACCES AU BRULEUR

STEP #1 REMOVE THE BURNER
ACCESS PANEL



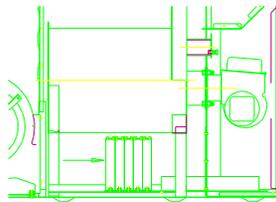
ETAPE #2 ENLEVER LE PROTECTEUR
DE FILS

STEP #2 REMOVE THE
WIRING DUCT



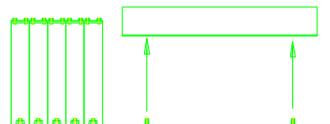
ETAPE #3 ENLEVER LE PANNEAU
D'ACCES AU TIROIR

STEP #3 REMOVE THE DRAWER
ACCESS PANEL



ETAPE #4 TIRER LE TIROIR
VERS SOI

STEP #4 PULL THE DRAWER
TOWARD YOU



ETAPE #5 ENLEVER LE PROTECTEUR
DE FIL DU TIROIR

STEP #5 REMOVE THE WIRE
HEAT SHIELD

Figure 6 : Electrical Diagram

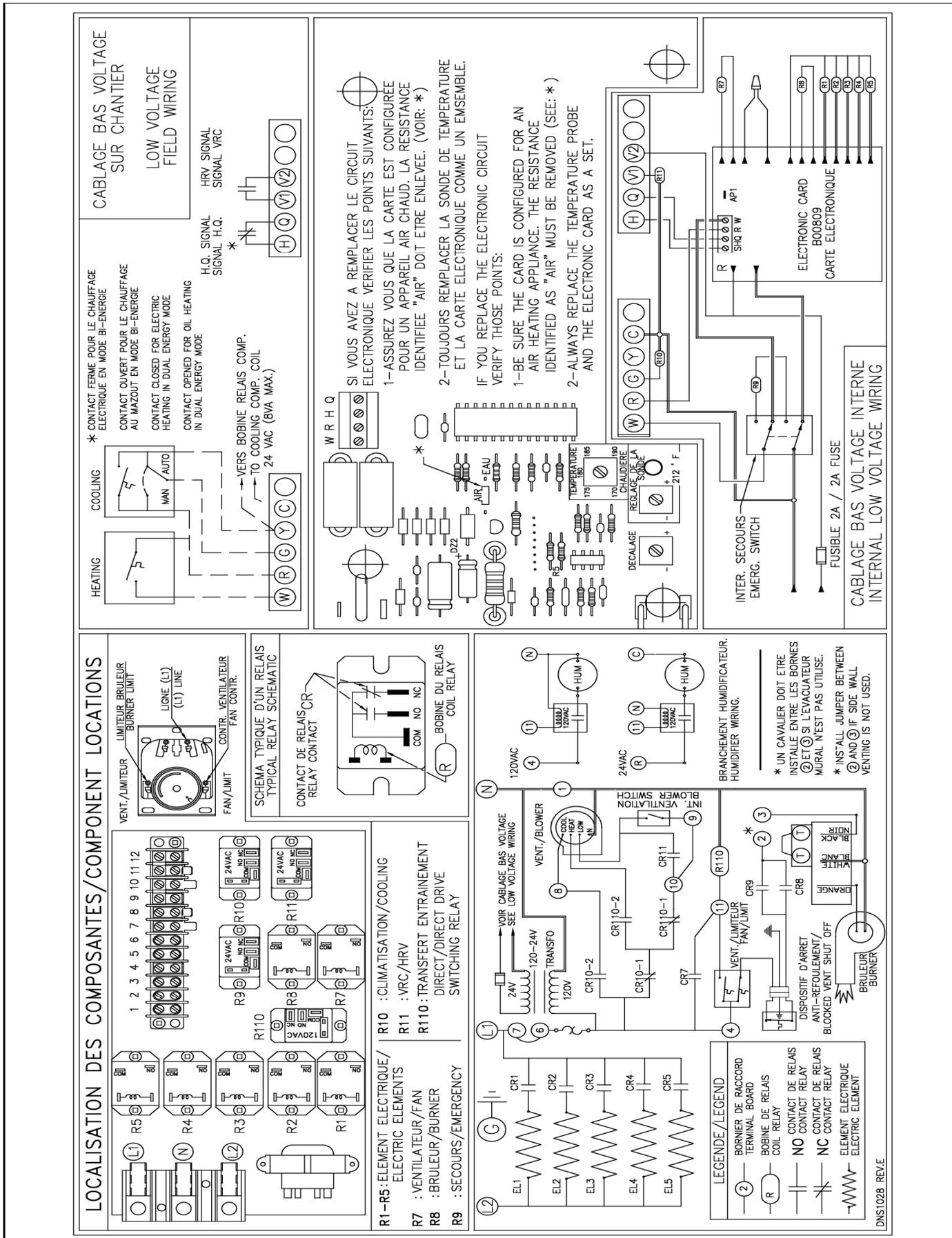
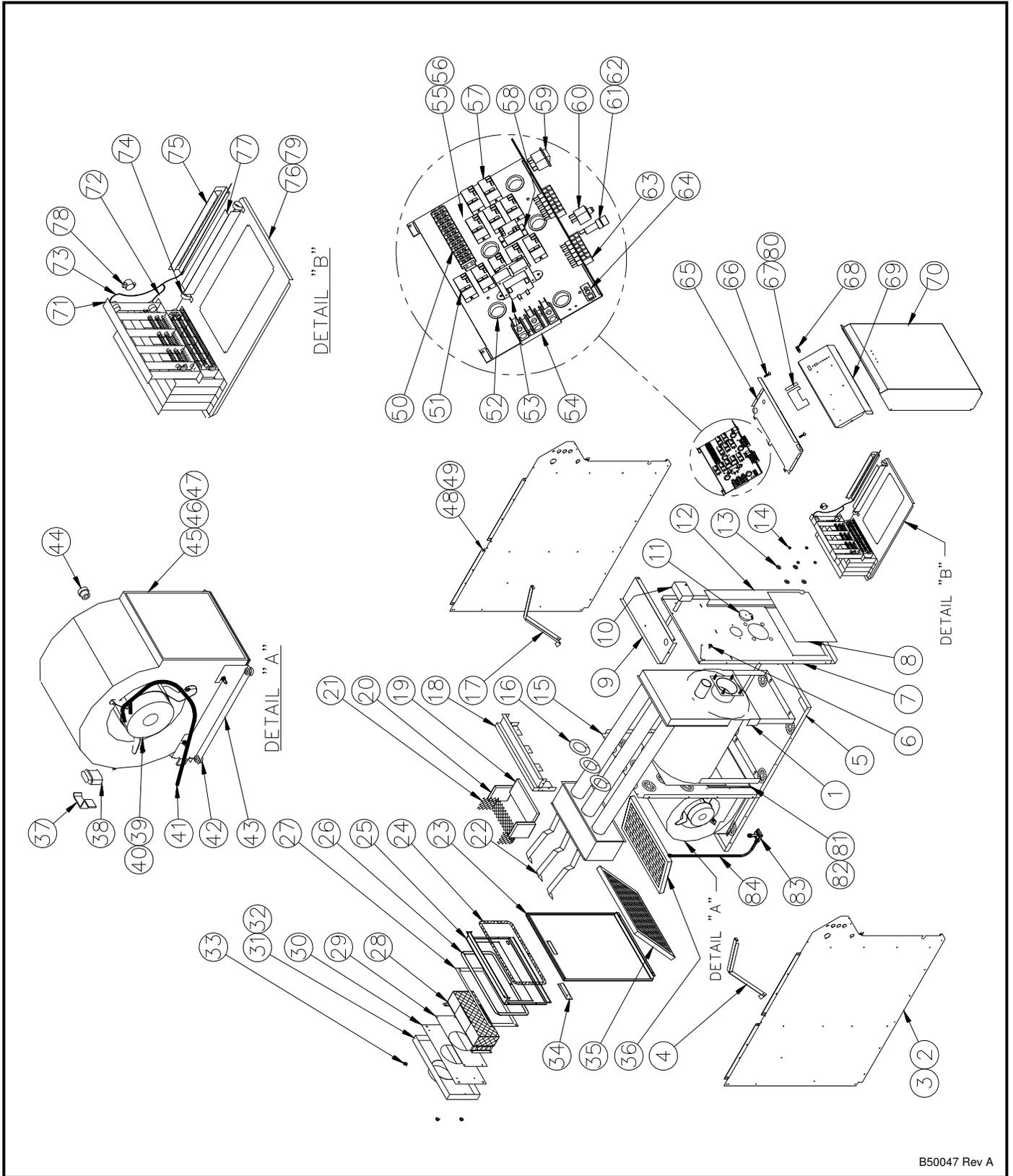


Figure 7 : Parts List



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Table 5 : Parts List

ITEM	NUMÉRO	DESCRIPTION
1	B02315	Heat exchanger ass'y
2	B03221-02	Left side panel ass'y
3	B01121-02	Left side insulation
4	B00725-02	Left side filter rack
5	B01157	Floor ass'y
6	B00703	Sensor support
7	B01159-01	Front divider panel ass'y
8	B00698	Electrical element acces door ass'y
9	B01089	Ducting adapter w ith knockout
10	R021002	High temp. control, HON L6064A, 11 1/2"
11	B02111	Observation door ass'y
12	B01137-01	Corner conduit
13	F06F005	Washer 3/8 zinc
14	F07F011	Hex nut 3/8-16 Zinc
15	B01026	Bottom divider plate ass'y
16	B01013	Gasket ring
17	B00725-01	Right side filter rack
18	B00658	Top divider plate
19	B00621-10	Insulation
20	B00621-09	Insulation
21	B00834-01	Sound trap insulation shield
22	B00711	Flue baffle
23	B03357	Door ass'y
24	B00702-08	Sound trap gasket
25	B03359	Back top panel
26	J06L002	Extruded joint 1/4" x 1/8" x 25'
27	B02306	Flue gas outlet joint
28	B02317	Sound trap insulation
29	B02305	Holding plate
30	B02301	Breech plate gasket
31	B02311	Breech plate
32	B02312	Sound trap ass'y
33	F07O001	Hex nut (brass)
34	Z99F050	Recessed handle, black
35	Z04F010	Paper filter 16" x 20" x 1"
36	Z04F001	Paper filter 10" x 20" x 1"
37	B01024	Capacitor support
38	L01I001	Capacitor 5 MF
39	B01890-01	Motor assembly 1/3 HP (Motor, belly band and legs included)
40	B01888	Belly band assembly (belly band and legs included)
41	B01664-01	Wiring kit
42	Z01F006	Rubber grommet
43	B01756	Blow er rack
44	L04I010	Strain relief bushing
45	B01404-01	Blow er ass'y
46	B03720-01	Blow er housing and w heel G10-10 DD
47	Z01L004	Blow er w heel G10 X 10 DD
48	B03221-01	Right side panel ass'y
49	B01121-01	Right side panel insulation
50	A00219	Terminal strip 12 position
51	L01H002	Relay SPST 24 VDC
52	L04G004	Bushing 1 1/4"
53	L01F009	Transformer 120-24V 40 VA
54	L99F004	Supply block
55	B01125	Electrical mounting panel
56A	B02286-01	Component panel ass'y AME-15
56B	B02286-02	Component panel ass'y AME-20
56C	B02286-03	Component panel ass'y AME-25
57	L01H009	Relay SPDT 24 VAC
58	L01H011	Relay SPDT 120 VAC
59	L07F002	Rocker sw itch

Table 5 : Parts List (continued)

ITEM	NUMÉRO	DESCRIPTION
60	L01J002	Breaker 15 AMP
61	L02G001	BUSS fuse holder
62	L01G002	Fuse 2A
63	L05F001	6 position BUSS terminal strip
64	L99G001	Ground terminal lug
65	B02313	Inside electrical panel ass'y
66	K03009	Thumbscrew kit
67	K08018	Electronic card
68	L07F003	Rocker sw itch
69	B02310-04	Top electric panel ass'y
70	B01154	Acces door
71	B01095	Electrical element ass'y
72	A00207-11	Red w ire
73	A00201-19	Black w ire
74	L04J002	Cable clamp
75	B01123-03	Element draw er
76	B01123-01	Element draw er
77	B01123-02	Element draw er
78	B01109-01	Therm-o-disc
79A	B01097-01	Element draw er ass'y AME-15
79B	B01097-02	Element draw er ass'y AME-20
79C	B01097-03	Element draw er ass'y AME-25
80	B00924	Electrical kit, quick connect
81	B01291-01	Seal strip, 1 1/2" x 13 1/8"
82	B01025-02	Metal strip
83	Z06G001	Blocked vent shut-off BVSO-225-A
84	B03118-01	Electrical kit for BVSO (ext.)

