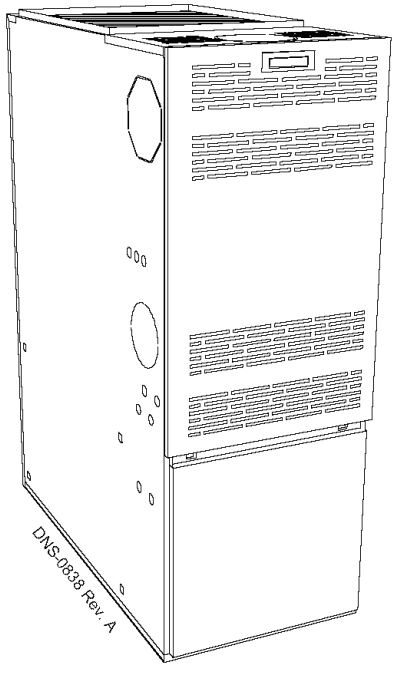
Installation instructions and homeowners manual



Models:

NOMF105D12A

NOMF155E19A

MULTIPOSITION INSTALLATION WITH CHIMNEY

c UL us

MULTI POSITION WARM AIR FURNACE

Save these instructions for future reference.

Manufactured by:

ICP Corporation (Canada)

3400 Blvd Industriel Sherbrooke PQ Canada

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

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PART 1
INSTALLATION

SAFETY CONSIDERATIONS

INSTALLATION OF OIL FIRED HEATING UNITS SHALL BE IN ACCORDANCE WITH THE REGULATION OF AUTHORITIES HAVING JURISDICTION, IN CANADA THE CSA B139 OR IN UNITED STATES THE 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) SAFETY LABELLING AND SIGNAL WORDS

1.1) Danger, Warning and Caution:

The signal words **DANGER, WARNING** and **CAUTION** are used to identify levels of hazard seriousness. The signal word **DANGER** is only used in product labels to signify an immediate hazard. The signal words **WARNING** and **CAUTION** will be used on product labels and throughout this manual and other manuals that may apply to the product.

1.2) Signal Words:

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

WARNING – Hazards or unsafe practices which **COULD** result in death or injury.

CAUTION – Hazards or unsafe practices which **COULD** result in personal injury or product or property damage.

1.3) Signal Words in Manuals:

The signal word **WARNING** is used throughout this manual in the following manner:

⚠ WARNING

The signal word **CAUTION** is used throughout this manual in the following manner:

CAUTION

2) SAFE INSTALLATION REQUIREMENTS

⚠ WARNING

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

If the furnace were installed in that position, oil could drain into the furnace vestibule and create a fire hazard, instead of draining properly 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 is adequate and conforms to governing codes and ordinances.

a. This furnace is NOT approved for installation in mobile homes, trailers or recreation vehicles.
b. You must have a sufficient supply of fresh air for combustion and ventilation to the area in which the furnace is located.
c. Do **NOT** use this furnace as a construction heater or to heat a building that is under construction.
d. Use only the Type of fuel oil approved for this furnace (see **Rating Plate** on unit). Overfiring will result in failure of heat exchanger and cause dangerous operation.
e. Visually check all oil line joints for signs of wetness, which would indicate a leak.
f. Connect furnace to the chimney.
g. The points in Part 2 "Operation" are vital to the proper and safe operation of the heating system. Take the time to be sure they are all done.
h. Follow the rules of the NFPA Pamphlet No.31 (for USA) and B-139 (for Canada) or local codes for locating and installing the oil storage tank.
i. Follow a regular service and maintenance schedule for efficient and safe operation.

j. Before servicing, allow furnace to cool. Always shut off electricity and fuel to furnace when servicing. This will prevent electrical shock or burns.
k. 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.

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 recognised 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.

2.2) Freezing Temperature and Your Structure:

⚠ WARNING

Freeze warning.

Turn off water system.

If your unit 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 will be unattended during cold weather you should take these 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. Suggest they call a qualified service agency, if required.

2.3) Installation regulation:

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 C22.2 No3	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.

3) LOCATING THE FURNACE

CAUTION

Check carefully 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 as an upflow, counterflow or horizontal furnace (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" thick.

When installed in the counterflow position, this furnace must not be installed on combustible flooring, unless the approved sub-base is used (Model # DFB-101). The flue pipe must exit the cabinet through one of the panel opening, then extended up the side of the furnace. Care must be taken to insure that the clearances from the flue pipe to combustible construction are maintained.

Also, it is recommend to use the flue pipe guard kit (Model # FPG-101 or # FPG102) to insure that a fire hazard condition does not exist.

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 allowed for in the support 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. Therefore, it may be installed in a closet or similar enclosure.

The required minimum clearances for this furnace in all positions are specified in tables # 3.2 and 3.3.

The furnace should be located as close as possible to the chimney or vent in order to keep vent connections shorts and direct. The furnace should also be located as near 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 Part 1, section 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.

4) VENTING

! WARNING

Poison carbon monoxide gas, fire and 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 co-vented with other combustion appliances such as a water heater, the allowable venting materials (i.e. L-Vent etc.) for use with those appliances should also be investigated.

! WARNING

Poison 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 or requirements of the local utility.

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

For additional venting information refer to ANSI/NFPA 211 Chimney, 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). 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:

a. Inspection for any deterioration in the chimney or vent. If deterioration is discovered, the chimney must be repaired or the vent must be replaced.

b. Inspection to ascertain that the vent system is clears and free of obstructions. Any blockage must be cleared before installing this furnace.
c. Clearing the chimney or vent if previously used for venting a solid fuel burning appliance or fireplace.
d. Confirming that all unused chimney or vent connections are properly sealed.
e. Verification that the chimney is properly lined and sized per the applicable codes. (Refer to list of codes on page 3.)

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 for a safe venting system:
a. Ensure that the chimney flue is clear of any dirt or debris.
b. Ensure that the chimney is not servicing an open fireplace.
c. Never reduce the pipe size below the outlet size of the furnace.
d. All pipes should be supported using the proper clamps and/or straps. These supports should be at least every four (4) feet.
e. All horizontal runs of pipe should have at least a 1/4" per foot of upward slope.
f. All runs of pipe be as short as possible with as few turns as possible.
g. Seams should be tightly joined and checked for leaks.
h. The flue pipe must not extend into the chimney but be flush with the inside wall.
i. The chimney must extend three (3) feet above the highest point where it passes through a roof of a building and at least two (2) feet higher than any portion of a building within a horizontal distance of ten (10) feet. It shall also be extended at lest five (5) feet above the highest connected equipment flue collar.
j. Check local codes for any variance.

Factory Built Chimneys:

May use listed factory built chimneys. Refer to chimney manufacturer's instructions for proper installation.

4.1) BAROMETRIC DRART CONTROL

The barometric draft control shipped with furnace MUST be used with furnace to ensure proper operation. Instructions for installing control are packed with control.

5) AIR FOR COMBUSTION

⚠ WARNING

Poison carbon monoxide gas hazard.

Comply with ANSI/NFPA (in U.S.) or CSA (in Canada) standard for the installation of Oil Burning Equipment and applicable provision 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.

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 requirement for the furnace. However, home improvements such as new windows, doors, and weather stripping have dramatically reduced the volume of air leakage into the home.

When this furnace is installed in a closet or enclosure, two (2) ventilation openings are required for combustion air. The openings should be located about 6" from the top and the bottom of the enclosure at the front of the furnace. Table # 1 indicates the minimum ventilation openings dimensions required.

TABLE # 1

Input (MBTUH)	Length (in.)	Height (in.)
75 – 105	16	8
120 - 155	20	10

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

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

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 for combustion.

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

a. Commercial building.
b. Building with indoor pools.
c. Furnaces installed near chemical storage areas.

Exposure to these substances:

a. Permanent wave solutions for hair.
b. Chlorinated waxes and cleaners.
c. Chlorine based swimming pool chemicals.
d. Water softening chemicals.
e. De-icing salts or chemicals.
f. Carbon tetrachloride.
g. Halogen type refrigerants.
h. Cleaning solvent (such as perchloroethylene).
i. Printing inks, paint removers, varnishes, etc..
j. Hydrochloric acid.
k. Solvent cements and glues.
l. Antistatic fabric softeners for clothes dryers.
m. Masonery acid washing materials.

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 follow 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 (more than 8' lift use 2 stage pump and more than 16' an auxiliary pump).

Follow the pump instructions to determine the size of tubing you need in relation of the lift, or the horizontal distance. At the beginning of each heating season or each year, verify the complete oil distribution system for oil leak.

At the beginning of each heating season or each year, verify the complete oil distribution system for oil leak.

7) BURNER INSTALLATION

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

Mounting the burner:

a. The warm air furnace burner mounting plate has a four bolts configuration.
b. 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:

a. Remove drawer assembly or air tube combination
b. Install nozzle (see specifications)
c. Confirm electrode settings
d. Make the electrical connections
e. Complete oil line connections

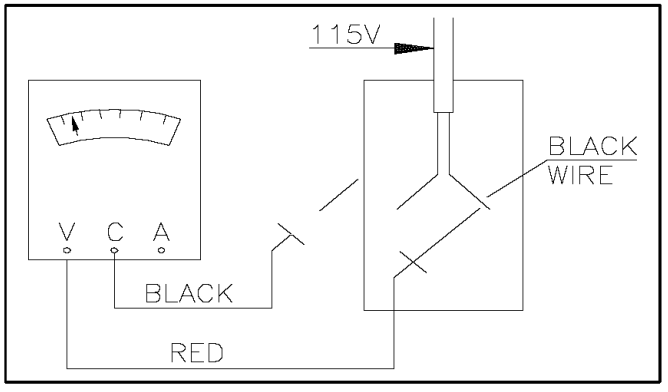
CAUTION
Do not turn on the burner until you have checked the polarity

Checking the polarity:

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

a. Set your voltmeter to line voltage.
b. Place one prong on your grounded electric entry box and one prong on the black wire.
c. Read the voltage.
d. If the voltage is zero, check the white wire. If line voltage shows. Reverse the 115-volt leads entering the furnace junction box.

FIGURE # 1



Nozzles:

The burners are provided with the highest capacity USGPH nozzle installed. If another size nozzle, or replacement nozzle is required, use the nozzle spray angle, type and manufacturer recommended in Table #3. Note that all nozzle-marked 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.

Air and turbulator settings:

Before starting the burner for the first time, adjust the air and turbulator settings to those listed in the Table #3. Once the burner becomes operational, final adjustment will be necessary.

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 the fuel tank is adequately 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 odor the first time your furnace is operated. This will soon disappear. It is only the oil used on the parts during manufacturing.

8) INSTALLING ACCESSORIES

⚠ WARNING

Electrical shock hazard.

Turn OFF electric power at 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.

8.1) Air conditioning:

An air conditioning coil may be installed on the supply airside only. Also, a minimum clearance must be allowed between the bottom of the coil drain pan, and the top of the heat exchanger according to the coil manufacturer instruction. Wire the thermostat and condensing unit contactor as indicated in the wiring diagram (figures # 4 and # 4.1).

8.2) Ductwork and Filter:

Installation:

Design and install 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 and 3.1 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 cut out requirement to assembly of air filter rack and return ductwork. (We recommend the use of this opening for horizontal installations).

When furnace supply ducts carry air outside furnace area, seal return air duct to furnace casing and terminate duct outside furnace space.

Install air conditioning cooling coil (evaporator) on downstream (in the supply air plenum) or furnace.
If 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

Poison 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

Poison 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

1) SEQUENCE OF OPERATION

1.1) Sequence of operation - Beckett AFG:

1. Normally open contact (T-T) on primary relay closed when thermostat calls for heat.
2. The motor starts and spark is established. The pump pressure builds and the poppet valve opens admitting fuel to the nozzle. Pressure builds and poppet valve opens, allowing oil to flow through nozzle.
3. Spark ignites oil droplets.
4. Cad cell senses flame and burner continues to fire.
5. After 60 sec., the fan control starts the circulating air blower and electronic air cleaner.
6. The circulating air blower and burner motor remain on until the thermostat is satisfied. The ignition transformer continues to spark.
7. Thermostat is satisfied.
8. Primary relay contacts open and the burner fan motor shuts down. The ignition transformer ceases sparking.
9. Depend on the delay of setting of the fan control, the circulating air blower stop after 60, 90, 120 or 150 seconds. (See part 2, section 2.4).

2) CHECKS AND ADJUSTMENTS

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 (see table # 3), before firing. These are rough adjustments but they will ensure that the burner will start and run smoke-free in advance of the fine adjustments being made.

Open the oil bleed port screw and start the burner. Allow the oil to flush into a portable container for at least 10 seconds. Slowly close 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. Tighten the bleed screw and the burner will fire. Adjust the oil pressure as indicated in Table # 3.

2.2) Restart if Burner Should Stop:

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 YOUR SERVICEMAN

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.

2.3) Perform the smoke / CO2 test:

1. Pierce a test hole in the smoke pipe near the furnace breech. Insert the smoke test instrument probe into the open hole.
2. Starting with a zero smoke reading, gradually reduce the burner air setting until just a trace (#1 on Bacharach Scale) of smoke results.
3. Take a CO2 sample at the same test location where the smoke sample was taken. Note the CO2 reading associated with the #1 smoke condition.
4. Adjust the burner air setting to obtain a CO2 reading 1% lower than the reading associated with the #1 smoke.
5. This method of adjusting the CO2 will allow adequate excess air to ensure that the burner will burn clean for the entire heating season.

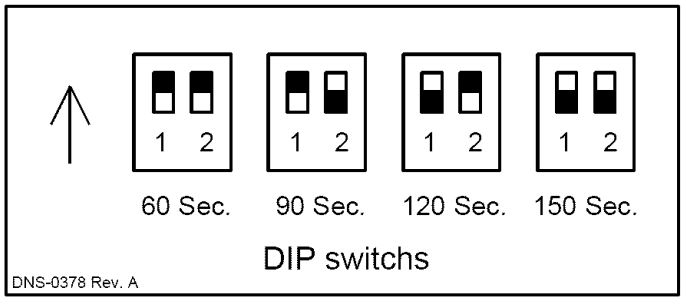
2.4) FAN ADJUSTMENT CHECK

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 rise specified on the rating plate (see table # 3). Consult the wiring diagram for speed changes on the direct drive motor.

To adjust fan OFF time, the DIP switches on the control board adjusted to obtain the desired timing (See figure # 2).

FIGURE # 2
Delay off setting



2.5) Vent temperature test:

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

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 in a few minutes.

For 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 # 3

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" the constant speed.

PART 3
MAINTENANCE

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 man.

After inspection, a complete combustion test must be performed after each annual service of the unit 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 controls. Call your service technician.

Before calling for service, check the following.

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

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

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 your 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 perfomed:

1. Turn "OFF" all utilities upstream of the furnace.
2. Disconnect the flue pipe.
3. Remove the flue collar panel located in the front part of the warm air furnace.
4. Remove the radiator baffles.
5. Disconnect the oil line and remove the oil burner from the furnace.
6. Clean the secondary tubes, and the primary cylinder with stiff brush and vacuum cleaner.
7. After cleaning, replace the radiator baffles, flue collar plate and oil burner.
8. 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 fouled condition.

1.2) BLOWER REMOVAL

To remove the blower from the furnace:

1. Turn "OFF" all utilities upstream of the furnace.
2. Remove the burner access door and blower door.
3. Remove the blower retaining screw (on the blower rails).
4. Remove cover from control box and disconnect the thermostat and power wires from the board.
5. Slide the blower forward on the rails toward the front of the unit.
6. Reverse the above steps to reinstall the blower. (Refer to wiring diagram figures # 4 à 4.1 of this instruction 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 out of the mounting rails, especially in the horizontal, in order to prevent dropping the blower and injuring yourself or damaging the blower!

To remove the blower from the furnace:

1. Turn "OFF" all utilities upstream of the furnace.
2. Remove the burner access door and blower door.
3. Remove the blower retaining screw (on the blower partition panel).
4. Remove cover from control box and disconnect the thermostat and power wires from the board.
5. Slide the blower forward on the rails toward the front of the unit.
6. Reverse the above steps to reinstall the blower. (Refer to wiring diagram figures # 4 à 4.1 of this instruction or the diagram located on the inside of the blower door to properly rewire the unit.)

1.3) Burner drawer assembly:

Remove the drawer assembly. Clean all foreign matter from the retention head and electrodes. If a Beckett AFG burner has been installed, the burner will have to be removed to check the retention head and to check for proper "Z" dimension with the Beckett "T" gauge supplied with every burner. Check for any sign of oil boiling out of the nozzle and caulking - the solenoid valve could be leaking (if applicable).

1.4) Nozzle:

Replace the nozzle with the one specified in table # 3.

1.5) Oil filter:

Tank filter:
The tank filter should be replaced as required.

Secondary filter:
The 10 micron (or less) filter cartridges should be replaced annually.

1.6) Air filters:

Air filters are the disposable types. The disposable filters should be replaced on at least an annual basis. Dusty conditions, presence of animal hair etc. may demand much more frequent filter changes. Dirty filters will impact furnace efficiency and increase oil consumption.

1.7) Motor lubrication:

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

PART 4
INFORMATION

Model : _____ Serial number: _____

Date of installation of the furnace : _____

Service telephones - day : _____ Night : _____

Dealer's name and address : _____

_____

_____

RESULT OF START-UP TEST

Nozzle: _____ Pressure : _____ psi

Burner adjustments : Primary air _____

Fine air _____

Draw Assembly _____

CO^2 : _____ % Smoke scale : _____ (Bacharach)

Gross stack temperature: _____ ^{0} F

Ambiant temperature: _____ ^{0} F

Chimney draft: _____ " C.E.

Overfire draft : _____ " C.E.

Test made by : _____

TABLE # 3
Technical specifications, NOMF

Model : NOMF	75	90	105	120	140	155
RATING AND PERFORMANCE						
Firing rate (USGPH)	0.5	0.65	0.75	0.85	1	1.1
Input (BTU/h)	70 000	91 000	105 000	119 000	140 000	154 000
Heating capacity (BTU/h)	57 000	74 000	85 000	97 000	115 000	126 000
AFUE %	80	80	80	80	80	80
Heating temperature rise (Degr. F)	55 - 85 Degr. F			55 - 85 Degr. F		
BECKETT BURNER; MODEL AFG (3450 rpm)	**AFG-F3**			**AFG-F3**		**AFG-F6**
Low firing rate baffle	YES			YES		YES
Static disc, model	3 3/8" # 31646			2 3/4" # 3383		2 3/4" # 3383
Nozzle - 100 PSIG pump pressure (Delavan)	0.50 - 70W	0.65 - 70W	0.75 - 70B	0.85 - 70B	1.00 - 70W	1.10 - 70W
Combustion air adjustment (band/shutter)	0 / 5	0 / 7	0 / 8	1 / 8	4 / 4	2 / 8
ELECTRICAL SYSTEM						
Volts - Hertz - Phase	115-60-1			115-60-1		
Operating voltage range	104 - 132			104 - 132		
Rated current (Amps)	12.2			15.7		
Minimum ampacity for wiring sizing	13.7			18.1		
Max. wire lenght (ft)	26			26		
Max. fuse size (Amps)	15			20		
Control transformer	40 VA			40 VA		
External control power available Heating	40 VA			40 VA		
Cooling	30 VA			30 VA		
BLOWER DATA						
Blower speep at 0.5" W.C. static pressure	MED-LOW	MED-HIGH	HIGH	MED-LOW	MED-HIGH	HIGH
Motor (HP) / number of speeds	1/3 HP / 4 speeds			3/4 HP / 4 speeds		
Blower wheel size (in)	10 X 10			12 X 10		
Filter quantity and size	16 X 24			20 X 30		
DIMENSIONS						
Overall W x L x H (in)	20 x 35 x 48.75			20 x 39.50 x 53		
Shipping weight (Lbs)	220			250		
Supply air duct (in)	19 x 20			19 x 24		
Return air duct (in)	15 x 23			17 x 29		

TABLE # 3.1
Air delevery – CFM with air filter

	NOMF105D12A EXTERNAL STATIC PRESSURE WITH AIR FILTER			
SPEED	0.2	0.3	0.4	0.5
HIGH	1425	1350	1305	1250
MED-HIGH	1130	1045	1000	950
MED-LOW	840	810	770	740
	NOMF155E19A EXTERNAL STATIC PRESSURE WITH AIR FILTER			
SPEED	0.2	0.3	0.4	0.5
HIGH	2080	2041	1965	1864
MED-HIGH	1892	1859	1770	1675
MED-LOW	1556	1475	1394	1318

FIGURE # 4

Wiring diagram, NOMF105D12A, Beckett burner

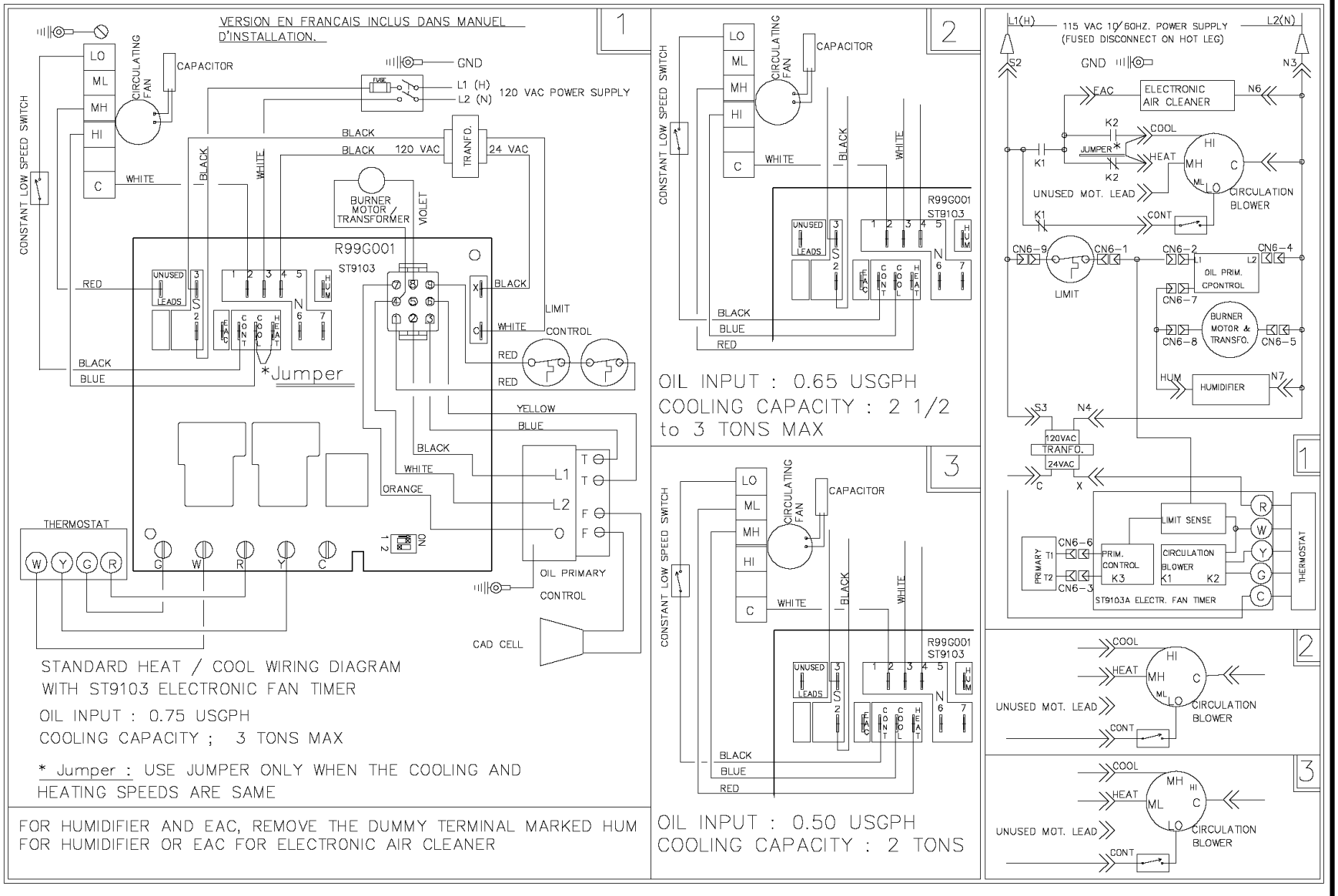


FIGURE # 4.1
Wiring diagram, NOMF155E19A, Beckett burner

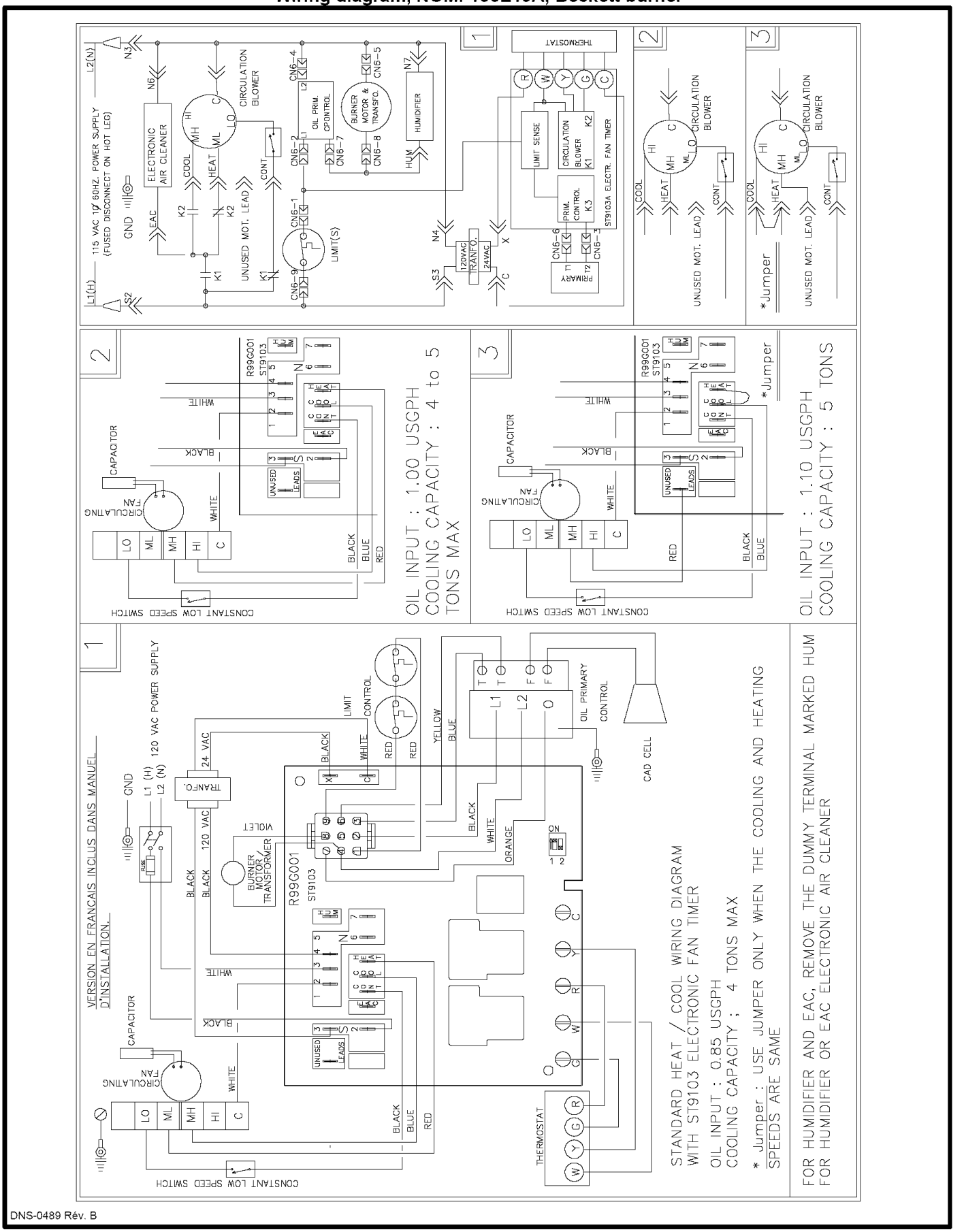


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FIGURE # 3
Model: NOMF105D12A

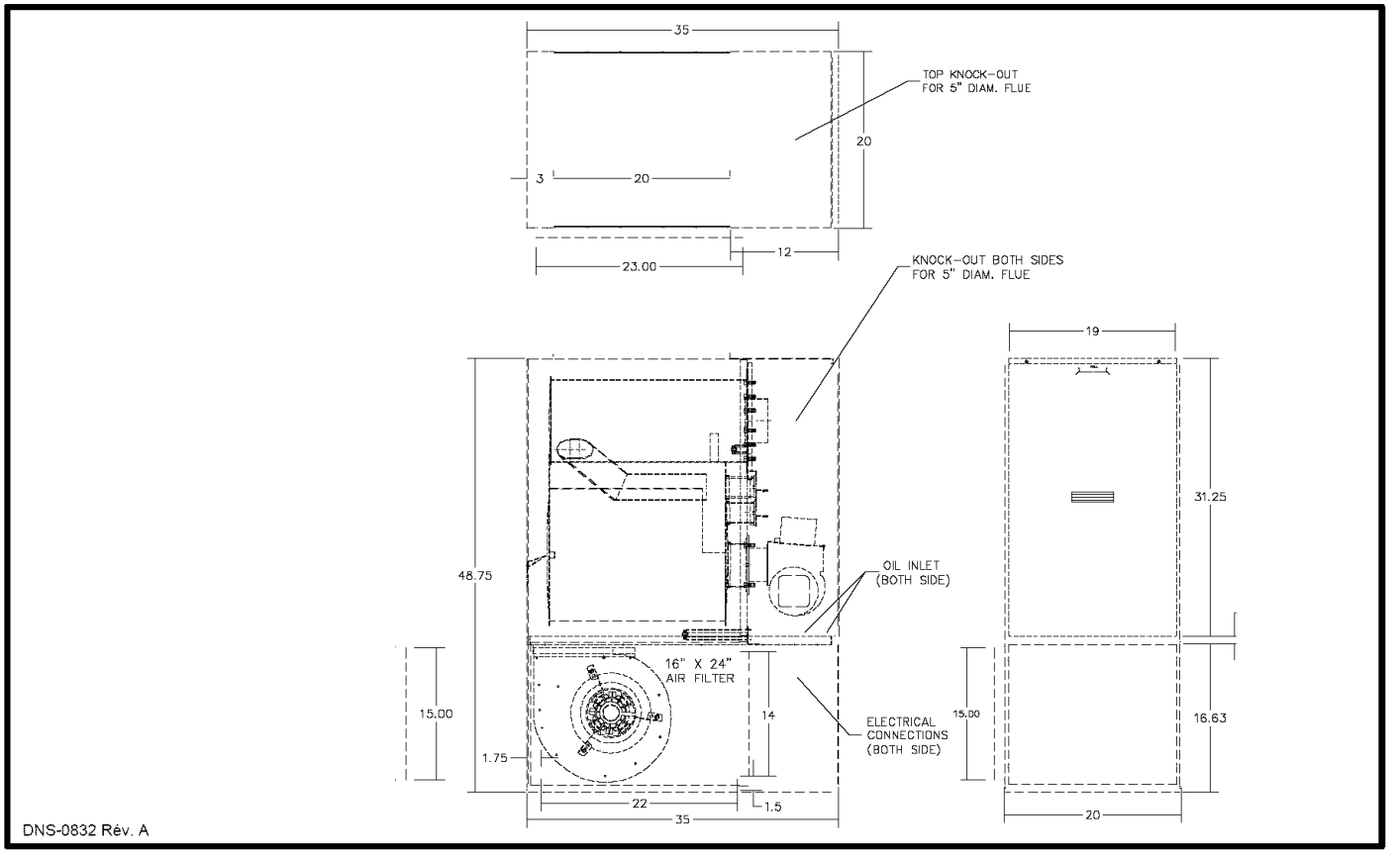


TABLE # 3.2
Minimum clearances – combustion materials (in), MODEL: NOMF105D12A

LOCATION	APPLICATION	UPFLOW	DOWNFLOW	HORIZONTAL
SIDE	FURNACE	0	2	2
	SUPPLY PLENUM WITHIN 6 FT OF FURNACE	1	2	1
BACK	FURNACE	0	1	0
TOP	FURNACE OR PLENUM	2	2	2
	HORIZONTAL WARM AIR DUCT WITHING 6 FT OF FURNACE	2	2	3
BOTTOM	FURNACE (**COMBUSTIBLE FLOOR WITH THE SUBBASE)	0	**0	**0
FLUE PIPE	HORIZONTALLY OR BELOW FLUE PIPE	4	4	4
	VERTICALLY ABOVE FLUE PIPE	9	9	9
FRONT	FURNACE	8	8	24

FIGURE # 3.1
Model: NOMF155E19A

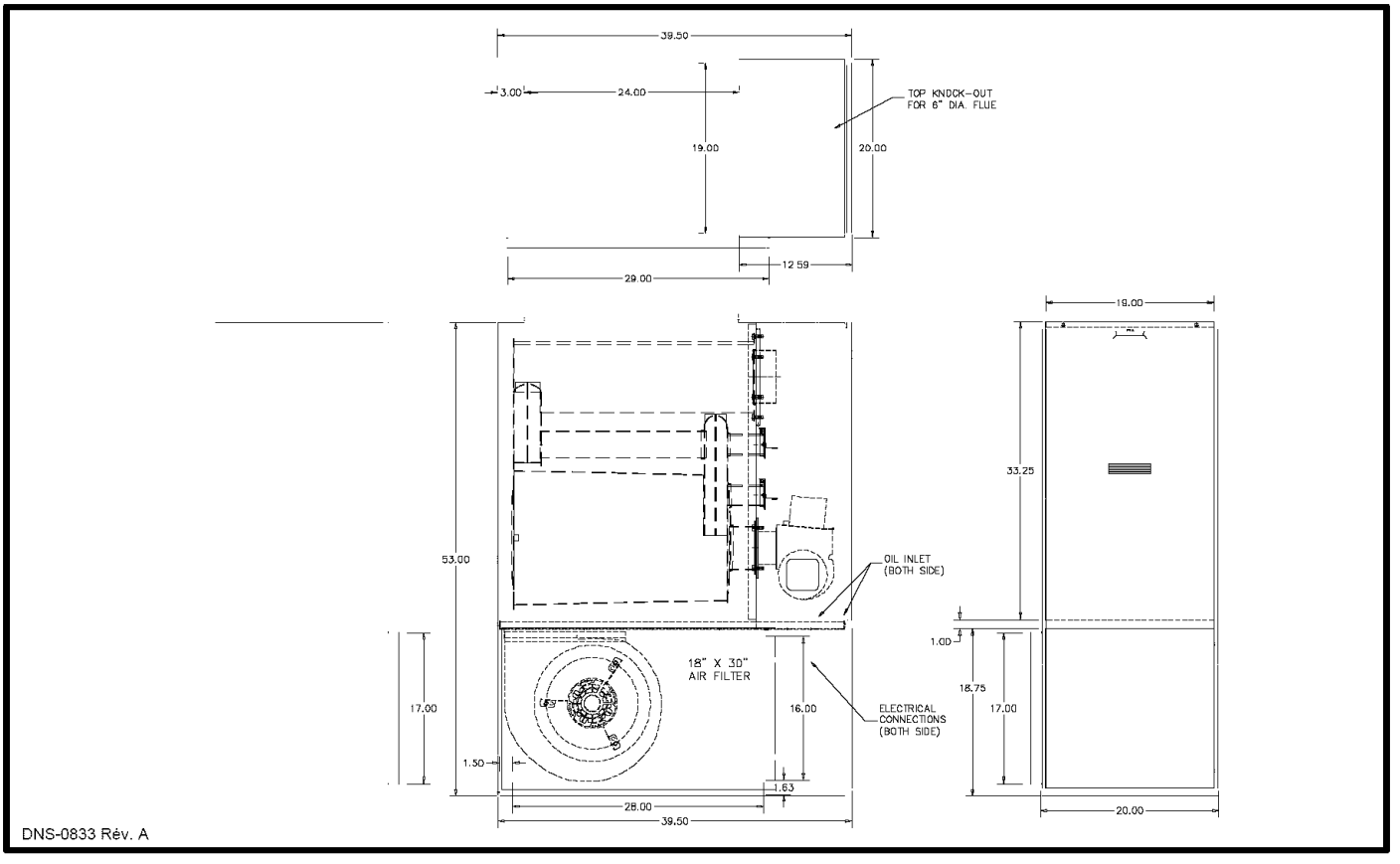
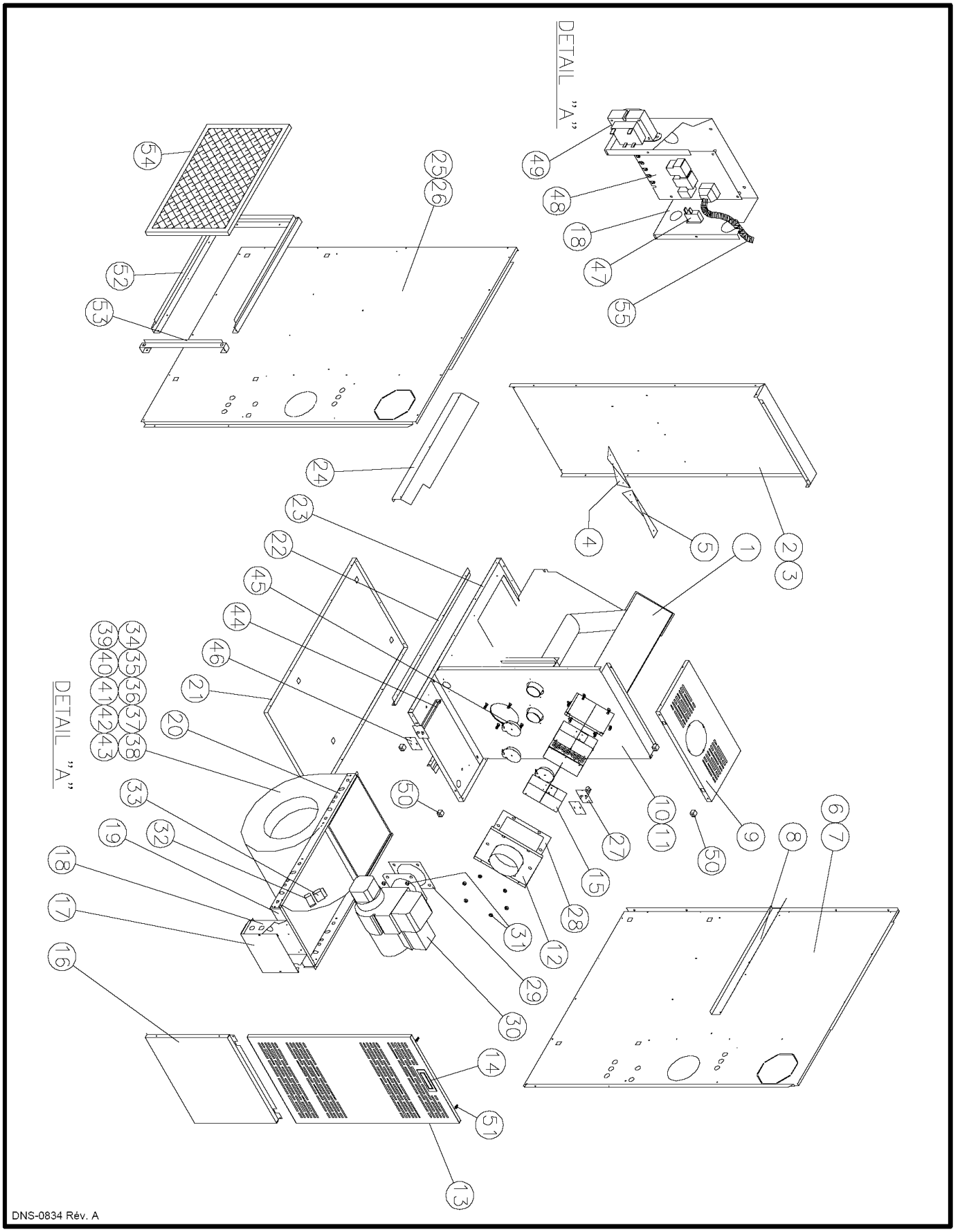


TABLEAU # 3.3
Minimum clearances – combustion materials (in), MODEL: NOMF155E19A

LOCATION	APPLICATION	UPFLOW	DOWNFLOW	HORIZONTAL
SIDE	FURNACE	1	2	2
	SUPPLY PLENUM WITHIN 6 FT OF FURNACE	1	2	1
BACK	FURNACE	0	1	0
TOP	FURNACE OR PLENUM	2	2	2
	HORIZONTAL WARM AIR DUCT WITHING 6 FT OF FURNACE	2	2	3
BOTTOM	FURNACE (**COMBUSTIBLE FLOOR WITH THE SUBBASE)	0	**0	**0
FLUE PIPE	HORIZONTALLY OR BELOW FLUE PIPE	4	4	4
	VERTICALLY ABOVE FLUE PIPE	9	9	9
FRONT	FURNACE	8	8	24

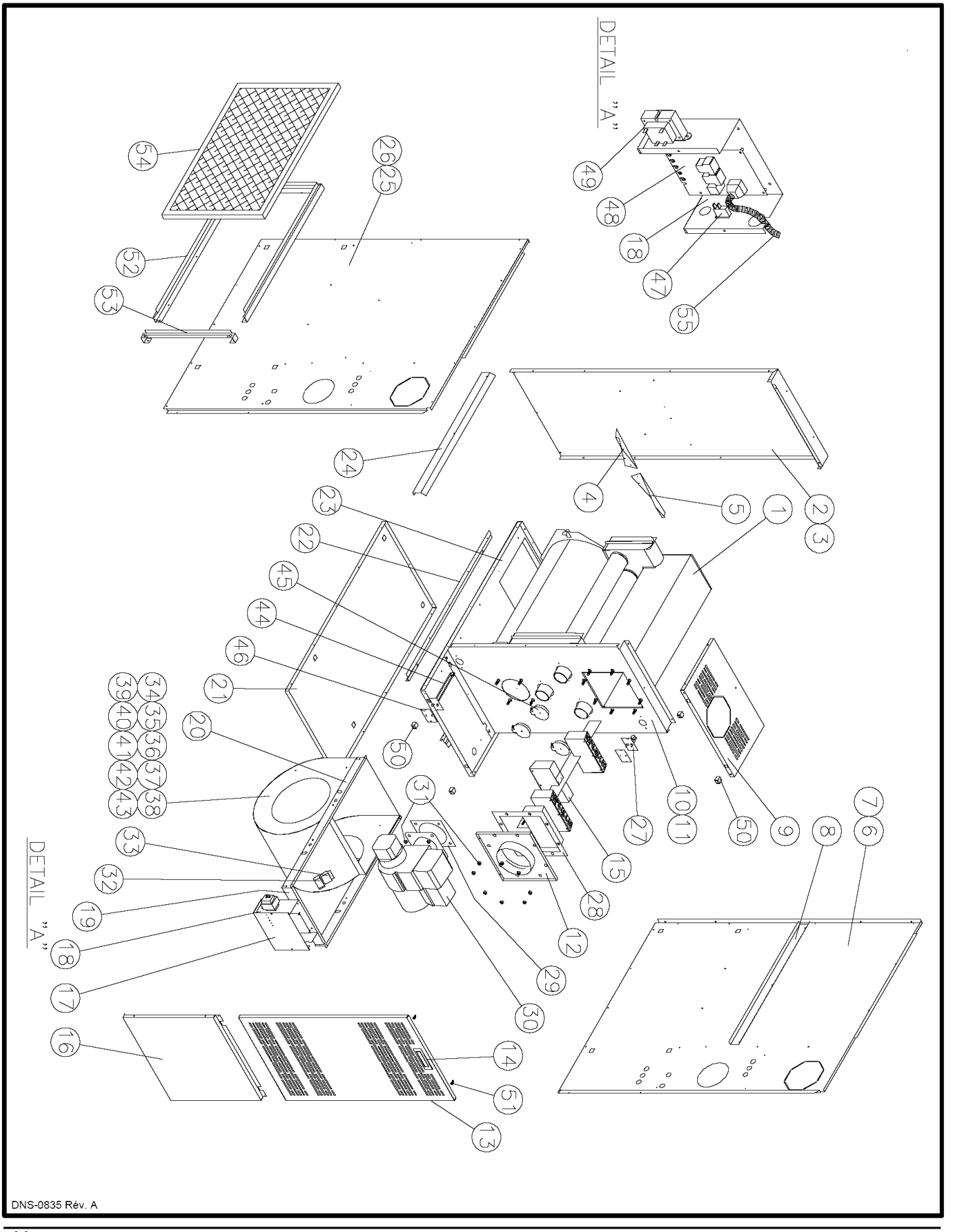
PARTS LIST
Modèle : NOMF105D12A



Modèle : NOMF105D12A
PARTS LIST

ITEM	DESCRIPTION	NUMBER	COMMENTS
1	Heat exchanger	B01667	
2	Back panel ass'y	B01728	INCLUDES PANEL, INSULATION AND BAFFLE
3	Back panel insulation	B01526-11	
4	Left back baffle	B01686-02	
5	Right back baffle	B01686-01	
6	Right side panel ass'y	B01885-01	INCLUDES PANEL, INSULATION AND BAFFLE
7	Right side panel insulation	B01645-01	
8	Right side baffle	B01679-01	
9	Front top panel ass'y	B01861	INCLUDES PANEL AND LATCHES
10	Front divider panel ass'y	B01727	INCLUDES PANEL , INSULATION AND LABELS
11	Front divider panel insulation	B01646	
12	Flue pipe cover ass'y	B01697	
13	Front access door	B40011-06	DOOR, LATCHE AND HANDLE INCLUDED
14	Recess handle	Z99F050	
15	Radiator baffle ass'y	B01676	INCLUDES BAFFLES AND INSULATION
16	Blow er compartiment door ass'y	B01883	INCLUDES DOOR AND LABELS
17	Junction box cover	B01684	
18	Junction box	B01683	BOX ONLY
19	Junction box holder plate	B01682	
20	Blow er slides	B01681	2 REQUIRED
21	Floor	B01687	
22	Blow er slides support	B01680	2 REQUIRED
23	Blow er divider panel	B01846	PANEL ONLY
24	Left side baffle	B01679-02	
25	Left side panel ass'y	B01885-02	INCLUDES PANEL, INSULATION AND BAFFLE
26	Left side panel insulation	B01645-02	
27	Hi limit 175-20 F, 1.75 "	R02R003	
28	Gasket, flue pipe cover	B01214	
29	Gasket, burner flange	N01Z026	
30	Beckett Burner AFG-F3	B01536-01	
31	Hexagon nut 3/8-16NC zinc	F07F011	
32	Capacitor holder	B01024	
33	5 MF capacitor	L01I001	
34	1/3 HP direct drive motor	B01890-01	INCLUDES MOTOR AND LEGS
35A	Blow er ass'y	B01405-01	INCLUDES BLOWER, MOTOR, CAPACITOR
35B	Blow er 10 X 10	Z01I004	INCLUDES BLOWER WHEEL AND HOUSING
36	Blow er w eel 10 X 10	Z01L002	
37	Motor mounting, band	Z01F012	
38	Motor mounting, leg	Z01F013	3 REQUIRED
39	Screw for motor mount leg	F03F023	3 REQUIRED
40	Washer for motor mount leg	F03F010	3 REQUIRED
41	Nut for motor mount band	F07J001	
42	Bolt for motor mount band	F05F015	
43	Motor mount ass'y	B01888	
44	Hi limit 140-20 F, 7 "	R02R002	
45	Observation door ass'y	B01842	
46	Electrical insulating barrier	A00284	
47	Rocker sw itch SPST	L07F003	
48	Electronic fan timer	R99G002	
49	Transformer 120/24 VAC / 40 VA	K03040	
50	Female latche	Z99F003	
51	Male latche	Z99F038	
52	Filter rack U frame	B01695	
53	Filter rack access	B01696	
54	Paper filter 16 x 24 x 1	Z04F007	
55	Electrical kit	B00203	

PARTS LIST
Modèle : NOMF155E19A



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PARTS LIST
Modèle : NOMF155E19A

ITEM	DESCRIPTION	NUMBER	COMMENTS
1	Heat exchanger	B01787	
2	Back panel ass'y	B01877	INCLUDES PANEL, INSULATION AND BAFFLES
3	Back panel insulation	B01526-25	
4	Left back baffle	B01806-02	
5	Right back baffle	B01806-01	
6	Right side panel ass'y	B01875-01	INCLUDES PANEL, INSULATION AND BAFFLES
7	Right side panel insulation	B01800-01	
8	Right side baffle	B01805	
9	Front top panel ass'y	B01874	INCLUDES PANEL AND LATCHES
10	Front divider panel ass'y	B01878	INCLUDES PANEL, INSULATION AND LABELS
11	Front divider panel insulation	B01853	
12	Flue pipe cover ass'y	B01747	
13	Front access door	B40014-06	INCLUDES PANEL, HANDLE AND LATCHES
14	Recess handle	Z99F050	
15	Radiator baffle ass'y	B01751	INCLUDES INSULATION AND BAFFLE
16	Blow er compartiment door ass'y	B01873	INCLUDES DOOR AND LABEL
17	Junction box cover	B01684	
18	Junction box	B01683	BOX ONLY
19	Junction box holder plate	B01682	
20	Blow er slides	B01681	2 REQUIRED
21	Floor	B01804	
22	Blow er slides support	B01794	2 REQUIRED
23	Blow er divider panel	B01795	PANEL ONLY
24	Left side baffle	B01805	
25	Left side panel ass'y	B01875-02	INCLUDES PANEL, INSULATION AND BAFFLES
26	Left side panel insulation	B01800-02	
27	Hi limit 175-20 F, 1.75 "	R02R005	
28	Gasket, flue pipe cover	B00205	
29	Gasket, burner flange	N04Z026	
30	Beckett burner	B01537-01	
31	Hexagon nut 3/8-16NC zinc	F07F011	
32	Capacitor holder	B01024	
33	15 MF capacitor	L01I005	
34	3/4 HP direct drive motor	L06I004	MOTOR ONLY
35A	Blow er ass'y	B01406-01	INCLUDES BLOWER, MOTOR, CAPACITOR
35B	Blow er 12 X 10	Z01I008	INCLUDES WHEEL AND HOUSING
36	Blow er w eel 12 X 10	Z01L003	
37	Motor mounting, band	Z01F012	
38	Motor mounting, leg	Z01I009	
39	Screw for motor mount leg	F03F023	3 REQUIRED
40	Washer for motor mount leg	F03F010	3 REQUIRED
41	Nut for motor mount band	F07J001	3 REQUIRED
42	Bolt for motor mount band	F05F015	
43	Motor mount ass'y	B01889	
44	Hi limit 140-20 F, 7 "	R02R002	
45	Observation door ass'y	B01842	
46	Electrical insulating barrier	A00284	
47	Rocker sw itch SPST	L07F003	
48	Electronic fan timer	R99G002	
49	Transformer 120/24 VAC / 40 VA	L01F003-2	
50	Female latche	Z99F003	
51	Male latche	Z99F038	
52	Filter rack U frame (for 20" X 30" filter)	B01809	
53	Filter rack access (for 20" X 30" filter)	B01808	
54	Paper filter 20 x 30 x 1	Z04F013	
55	Electrical kit	B00203	