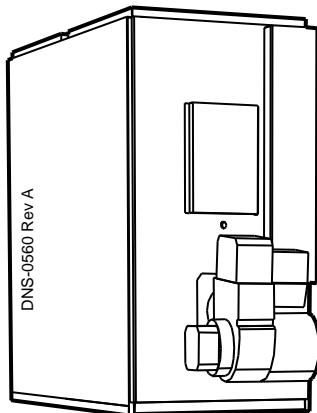
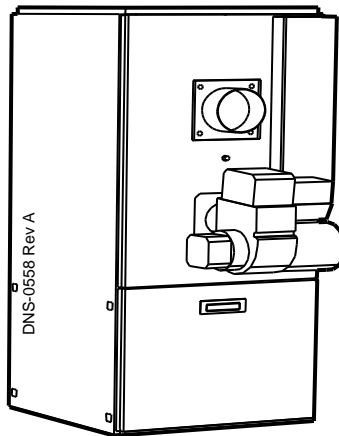


Installation Instructions and Homeowner's Manual

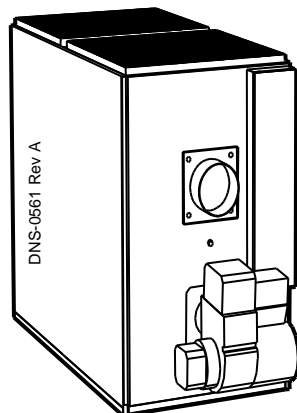
OIL FIRED FURNACE UPFLOW



OLR105 – OLB53R
OLR160 – OLB64R



OUF105 – OHB53F
OUF160 – OHB64F
NOUF105 – NOHB53F



OLF105 – OLB53F
NOLF105 – NOLB53F

INSTALLER / SERVICE TECHNICIAN:

USE THE INFORMATION IN THIS MANUAL FOR THE INSTALLATION AND 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.

Models:

OLR105A12D /
OLB53R
OLR160B20C /
OLB64R
OUF105A12C /
(N)OHB53F
OUF160B18C /
OHB64F
OLF105A12C /
(N)OLB53F
NOLF105A12D
NOUF105A12D



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

TABLE OF CONTENTS

1.0	SAFETY REGULATIONS	3
1.1	DANGER, WARNING AND CAUTION	3
1.2	SAFETY INSTALLATION REQUIREMENTS	3
2.0	INSTALLATION	3
2.1	SAFE INSTALLATION REQUIREMENTS	3
2.2	INSTALLATION SAFETY RULES	4
2.2.1	Detector	4
2.2.2	Freezing temperatures and your building	4
2.3	POSITIONING THE FURNACE	4
2.3.1	Location	4
2.4	VENTING	5
2.4.1	General	5
2.4.2	Chimney installations	5
2.4.3	Side-wall direct venting	6
2.5	AIR FOR COMBUSTION	6
2.5.1	General	6
2.5.2	Contaminated Combustion Air	6
2.5.3	Ducted outdoor combustion air	7
2.6	OIL TANKS AND LINES	7
2.7	BURNER INSTALLATION	7
2.7.1	Mounting the burner	7
2.7.2	After the burner is mounted	7
2.7.3	Checking the polarity	8
2.7.4	Checking the nozzle	8
2.7.5	Checking air and turbulator settings	8
2.7.6	Checking the fuel supply system	8
2.7.7	Blocked vent shut-off (BVSO)	8
2.8	INSTALLING ACCESSORIES	9
2.8.1	Electronic air cleaner	9
2.8.2	Humidifier	9
2.8.3	Air conditioning	9
2.8.4	Ductwork and Filter	9
3.0	OPERATION	9
3.1	MANUAL OPERATION SWITCHES	9
3.2	SEQUENCE OF OPERATION	9
3.2.1	Sequence of operation - Beckett AFII, Side-wall venting	9
3.2.2	Sequence of operation - Riello 40-BF, Side-wall Venting	10
3.2.3	Sequence of operation - Beckett AFG and Riello 40-F, chimney venting	10
3.2.4	Sequence of operation VTK Venting system	10
3.3	CHECKS AND ADJUSTMENTS	10
3.3.1	General	10
3.3.2	Restart after burner failure	11
3.3.3	Combustion chamber curing	11
3.3.4	Smoke / CO ₂ test	11
3.3.5	Perform the supply air temperature rise test	11
3.3.6	Vent temperature test (chimney installation)	11
3.3.7	Overfire pressure test procedure	11
3.3.8	Fan-Limit adjustment	11
3.3.9	Fan-Limit control check	11
3.3.10	Blocked intake/blocked vent test (VTK)	12
3.3.11	BVSO performance test	12
4.0	MAINTENANCE	12
4.1	PREVENTIVE MAINTENANCE	12
4.2	HEAT EXCHANGER	12
4.2.1	Cleaning the heat exchanger	13
4.2.2	Refractory firepot	13
4.3	BURNER	13
4.3.1	Drawer assembly	13
4.3.2	Nozzle	14
4.4	OIL FILTER	14
4.4.1	Tank filter	14
4.4.2	Secondary filter	14
4.5	AIR FILTERS	14
4.6	MOTOR LUBRICATION	14

4.7	CAS-2B COMBUSTION AIR KIT (chimney venting) - 14
4.8	BLOCKED VENT SHUT OFF (BVSO) CLEANING ---- 14
5.0	FURNACE INFORMATION----- 15

FIGURES

Figure 1 :	Voltmeter wiring	8
Figure 2 :	Manual operation switches	9
Figure 3 :	Fan-limit	12
Figure 4 :	OLB53R / OLR105	20
Figure 5 :	OLB64R / OLR160	20
Figure 6 :	OHB53F / OUF105	21
Figure 7 :	OHB64F / OUF160	21
Figure 8 :	OLB53F / OLF105	22
Figure 9 :	NOHB53F - NOUF105	22
Figure 10 :	NOLB53F - NOLF105	23
Figure 11 :	Wiring diagram	24
Figure 12 :	Parts list OLB53R / OLR105	24
Figure 13 :	Parts list OLB64R / OLR160	27
Figure 14 :	Parts list OHB53F / OUF105	29
Figure 15 :	Parts list OHB64F / OUF160	31
Figure 16 :	Parts list OLB53F / OLF105	33
Figure 17 :	Parts list NOLB53F - NOLF105	35
Figure 18 :	Parts list NOHB53F - NOUF105	37

TABLES

Table 1 :	Minimum Installation clearances from combustible materials (Chimney installation*)	5
Table 2 :	Flue pipe sizing	6
Table 3 :	Technical Specifications, OLB**R / OLR	16
Table 4 :	Technical Specifications, OHB / OUF & NOUF	17
Table 5 :	Technical Specifications, OLB53F / OLF105 & NOLF105	18
Table 6 :	Air delivery - CFM with air filter, OLB**R / OLR	19
Table 7 :	Air delivery - CFM with air filter, OHB**F / OUF & NOUF	19
Table 8 :	Air delivery - CFM with air filter, OLB53F / OLF105 & NOLF105	19
Table 9 :	Parts list OLB53R / OLR105	26
Table 10 :	Parts list OLB64R / OLR160	28
Table 11 :	Parts list OHB53F / OUF105	30
Table 12 :	Parts list OHB64F / OUF160	32
Table 13 :	Parts list OLB53F / OLF105	34
Table 14 :	Parts list NOLB53F - NOLF105	36
Table 15 :	Parts list NOHB53F - NOUF105	38

1.0 SAFETY REGULATIONS

FOR YOUR SAFETY

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

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

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 SAFETY INSTALLATION REQUIREMENTS



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 C22.2 No.3 Canadian Electrical Code

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

The National Fire Protection Agency
1 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 SAFE INSTALLATION REQUIREMENTS

- 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;



WARNING

Installation or repairs performed by unqualified persons can result in hazards to them and others. Installation **MUST** conform to local codes or, in the absence of same, 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 quipped with the proper tools and test instruments.

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



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.

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

- c. Use only the type of fuel oil approved for this furnace (see section 2.7.6 of this manual). Overfiring will result in failure of heat exchanger and cause dangerous operating conditions;
- d. Visually check all oil line joints for leaks;
- e. There must be a sufficient supply of fresh air for combustion as well as ventilation in the area where the furnace is located;
- f. Connect furnace to a side-wall terminal or chimney;
- g. The points in Part 3 "Operation" are vital to the proper and safe operation of the heating system. Take the time to ensure that all steps were followed;
- h. Follow the regulations of the NFPA Pamphlet No.31 (USA) and CSA B-139 (Canada) or local codes for placing 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 that electrical components are protected from direct contact with water.

2.2 INSTALLATION SAFETY RULES

Your unit is built to provide many years of safe and dependable service, provided 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.

2.2.1 Detector

- 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 to potentially dangerous carbon monoxide levels, you should have carbon monoxide detectors listed by a nationally recognised agency (ex. Underwriters Laboratories or International Approval Services) installed and maintained in the building or dwelling (see Note below).
- 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 to 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

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



CAUTION

An air pressure switch MUST be used when the furnace is side-wall vented.



CAUTION

Do not use any commercially available soot remover. This furnace has a ceramic fibre type of combustion chamber. Normal servicing of this unit does not require the cleaning of same. Use extreme caution if for any reason you have to work in the area of the combustion chamber.

2.2.2 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 exhaust flues obstructed by snow, ice or debris.

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.

2.3 POSITIONING THE FURNACE

2.3.1 Location

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.



CAUTION

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 will lead to hazardous electrical conditions and to premature furnace failure.

Position the furnace as closely as possible to the chimney or vent terminal, providing ample clearance to permit easy accessibility for cleaning the inside of the furnace, the removal of filters, blower, motors, controls and flue connections.

However, do not install furnace directly on carpet or other combustible material which can trap air under the furnace floor.

The furnace must be installed level for safe and quiet operation.

The required minimum clearances for this furnace are specified in Table 1.



CAUTION

Do NOT operate furnace in a corrosive atmosphere containing chlorine, fluorine or any other damaging chemicals. Refer to section 2.5.2.

2.4 VENTING



WARNING

POISONOUS CARBON MONOXIDE GAS, FIRE AND EXPLOSION HAZARD.

Read and follow all instructions in this section.

Failure to properly vent this furnace can cause death, bodily injury and/or property damage.

2.4.1 General

Furnaces can be vented in several ways:

Chimney Vented

Using the Beckett AFG or Riello 40-F burner, the furnaces can be chimney vented with or without a barometric damper. The unit will operate at a **negative** overfire draft and flue draft.

Side-wall Vented

Using the Beckett AFII or Riello 40-BF burner with the integral pre- and post-purge controls, the system can be side-wall vented for maximum efficiency and without the use of a side-wall power vent. The unit will operate at a **positive** overfire draft and flue draft.



WARNING

POISONOUS CARBON MONOXIDE GAS HAZARD.

Never vent this furnace together with another combustion appliance when side-wall venting.

To do so may result in asphyxiation and death to the occupants.

Table 1 : Minimum Installation clearances from combustible materials (Chimney installation*)

LOCATION	APPLICATION	OLR160 - OUF160 OLB64R - OHB64F	OLR105 - (N)OLF105 - (N)OUF105 OLB53R - (N)OLB53F - (N)OHB53F
Sides	Furnace	2.54 cm (1")	2.54 cm (1")
	Supply plenum, warm air duct within 6' of furnace	2.54 cm (1")	2.54 cm (1")
Back	Furnace	45.72 cm (18")	2.54 cm (1")
Top	Furnace casing or plenum	5.08 cm (2")	2.54 cm (1")
Bottom	Furnace - combustible floor **	∅	∅
Front	Furnace	60.96 cm (24")	60.96 cm (24")

* See the Direct Vent manual for clearances of this application.

** Combustible floor requires accessory bases CFB-1 or HFB-1.

2.4.2 Chimney installations

When set up for chimney venting, this furnace is certified for use with an L-vent, A-vent, tile-lined and metal-liner-tile lined chimney, and can be vented both with and without a barometric draft damper. However, this furnace is not approved for use without a barometric damper if it is to be vented together with another oil-fired appliance such as a water heater.

With a barometric damper

This furnace may be vented into a chimney of suitable size and adequate chimney base temperature, as specified in the Installation Code. When a barometric damper is used, the air entering the damper reduces the possibility of vent condensation. The relevant excerpt from the code is found in this section and can be used as a guide where local or national codes do not exist. One option to increase the

chimney base temperature is to use vent connection insulation.

Without a barometric damper

Due to the lack of dilution air that would ordinarily be drawn into the barometric damper, the dew point of the flue gases is raised. To offset the increased tendency for vent condensation, the chimney must be lined. The liner must be insulated according to the insulating procedure recommended by the manufacturer of the liner. Also, the vent connector should be as short as possible and be double wall construction or of single wall construction with 2.54 cm (1") of insulation.

Flue pipe sizing

The following table is an excerpt from the Installation Code and indicates the permitted flue sizes and minimum base temperatures for circular flues in chimneys with a thermal resistance of less than R6 (6 ft² •hr •°F / Btu).

Where a new appliance, burner, or chimney is installed, chimney vent sizes and maximum flue gas temperatures shall comply with Table 2 (measured at the chimney connector with the barometric damper shut, after 5 minutes of operation).



CAUTION

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



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 the 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 death, personal injury and/or property damage.

Note: Thermal resistance values for typical chimneys are as follows:

R2 (2 ft² •hr •°F / Btu): Clay-lined masonry, A-vent

R3 (3 ft² •hr •°F / Btu): Metal liner in clay-lined masonry

R6 (6 ft² •hr •°F / Btu): Metal or clay-lined masonry with R4.5 (4.5 ft² •hr •°F / Btu) insulation between liner and masonry (e.g. 2" of expanded mica or 1 3/8" of high density glass fibreboard.)

Applying Table 2

Table 2 : Flue pipe sizing

Total input rating of all connected appliances			Inside diameter of flue		Minimum base temperature according to chimney height :			
kW	BTU/h	USGPH	Min.	Max.	11'	20'	28'	36'
21	70000	0.50	7.62 cm (3")	12.70 cm (5")	149°C (300°F)	204°C (400°F)	279°C (535°F)	385°C (725°F)
27	91000	0.65	7.62 cm (3")	12.70 cm (5")	135°C (275°F)	171°C (340°F)	221°C (430°F)	279°C (535°F)
31	105000	0.75	10.16 cm (4")	12.70 cm (5")	127°C (260°F)	160°C (320°F)	193°C (380°F)	246°C (475°F)
36	119000	0.85	10.16 cm (4")	12.70 cm (5")	121°C (250°F)	149°C (300°F)	179°C (355°F)	221°C (430°F)
41	140000	1.00	10.16 cm (4")	15.24 cm (6")	107°C (225°F)	149°C (300°F)	185°C (365°F)	221°C (430°F)
51	175000	1.25	10.16 cm (4")	15.24 cm (6")	116°C (240°F)	135°C (275°F)	160°C (320°F)	185°C (365°F)

Heat Recovery Ventilation Systems (HRVS) 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.

If a furnace with a 0.60 USGPH nozzle is to be connected to a 6.1 m (20') tall clay-lined masonry chimney, the thermal resistance of this type of chimney is R2, (which is less than R6). The actual firing rate at 156 psig is 1.25 x .60 = .75 USGPH. Therefore this table shall apply as follows:

- The minimum size permitted shall be 10.16 cm (4") in. inside diameter;
- The maximum size permitted shall be 12.70 cm (5") inside diameter;
- The minimum base temperature shall be about 160°C (320°F).

2.4.3 Side-wall direct venting

The furnace is approved with a direct vent system. The system includes a vent terminal model VTK-53 or VTK-64 and an isolated flex vent IFV-310, IFV-315, IFV-320, IFV-410, IFV-415 or IFV-420 model. Please refer to installation instructions accompanying the venting system for details.

2.5 AIR FOR COMBUSTION



WARNING

POISONOUS CARBON MONOXIDE GAS HAZARD.

Comply with NFPA or CSA 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 death or personal injury.

2.5.1 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 for the furnace. However, home improvements such as new windows, doors, and weather stripping have drastically 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 a negative pressure in the home. Should this occur the chimney becomes less and less effective and can easily downdraft.

2.5.2 Contaminated Combustion Air

Installations 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 certain substances, potentially requiring outside air for combustion:

- Commercial buildings;
- Buildings with indoor pools;

- c. Furnaces installed near chemical storage areas.

Exposure to the following substances:

- a. Permanent wave chemicals 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 based glue;
- l. Antistatic fabric softeners for clothes dryers;
- m. Acid based masonry cleaning materials.

2.5.3 Ducted outdoor combustion air

Three burners are set up to duct outside combustion air directly to the burner; the Beckett AFII and Riello 40-BF for side-wall venting and the Beckett AFG for use with conventional chimney venting. The Riello 40-F is not suitable for direct-connected outdoor air.



CAUTION

The use of ducted outside combustion air is mandatory for the side-wall direct venting system. This system operates on a balanced flue principle and will not function properly if the combustion air piping is not attached and sealed at all connections between the vent terminal and burner inlet.

Outdoor combustion air kit – chimney venting

The following kit has been certified for use on this appliance. The kit contains an important safety feature, namely a vacuum relief valve, or VRV. During normal operation the burner aspirates outdoor air. If the intake terminal ever becomes partially blocked or fully blocked from ice or snow etc., the VRV will open to allow a proportion of air from the dwelling to enter the burner thus maintaining proper combustion. Once the blockage is removed, the VRV will close and the burner will draw all air from the outdoors again.

CAS-2B

Components (except air duct) for the Beckett AFG burner: The kit includes the intake terminal, vacuum relief valve (VRV) and special air boot connection with integral air adjustment means for the AFG burner. The CAS-2B can be used with a 0.10 m (4") galvanized steel air duct or with a 0.10 m (4") flexible aluminium air duct. It is recommended that the metallic air ducting material be insulated from the air intake up to 1.5 m (5') from the burner, to avoid condensation on the outside of the intake pipe.



CAUTION

The CAS-2B does not turn the furnace installation into a direct vent system. Therefore, the building structure must provide for adequate combustion air to be delivered to the Vacuum Relief Valve. The burner will need to draw combustion air from the VRV's surroundings if the intake ever becomes blocked. Therefore, non-direct vent installation codes must be followed.

CAD-1

This air duct kit consists of 7.6 m (25') of insulated UL/ULC Listed Class 1 air duct and two 0.10 m (4") steel band clamps. The duct incorporates a corrugated flexible aluminium core, surrounded by fibreglass insulation and a vinyl vapour barrier.

Comprehensive installation instructions are provided with the kit.

2.6 OIL TANKS AND LINES

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

Prior to each heating season, have the entire oil distribution system checked for leaks.

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 burner level must employ a two pipe fuel supply system with an appropriate fuel pump; for more than a 2.4 m (8') rise use a 2-stage pump; for more than 4.9 m (16') rise an auxiliary pump.

Follow the pump instructions to determine the size of tubing you need in relation of the lift, or the horizontal distance.

2.7 BURNER INSTALLATION

2.7.1 Mounting the burner

The burner mounting plate on the furnace has a 4-bolt configuration.

1. Check the insertion depth of the burner tube. Refer to the Technical Specifications, table 3 to 5.
2. Position the mounting gasket between the mounting flange and the appliance burner mounting plate;
3. Line up the holes in the mounting flange with the studs on the mounting plate;
4. Securely bolt the burner in place with supply nuts.

2.7.2 After the burner is mounted

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



CAUTION

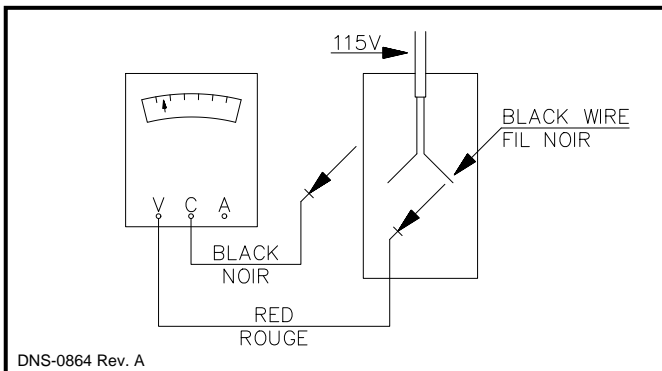
Do not turn on the burner until you have checked the following:

2.7.3 Checking the polarity

The oil burner used on the furnace has a solid state control system which is sensitive to the proper connection of the hot and neutral power lines. The controls will be damaged if the two lines are reversed.

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

Figure 1 : Voltmeter wiring



2.7.4 Checking the nozzle

The burner is equipped with the appropriate nozzle. However, if another size nozzle or replacement nozzle is required, use the manufacturer's nozzle data concerning spray angle, type as shown in Tables 3 to 5. Note that all nozzle sizes are based on a pump pressure of 100 psig.

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

2.7.5 Checking air and turbulator settings

Before starting the burner for the first time, adjust the air and turbulator settings to those listed in Tables 3 to 5. Once the burner becomes operational, final adjustments will be necessary.

2.7.6 Checking the fuel supply system

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 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.

IMPORTANT

When using nozzle sizes of less than .75 USGPH, the Installation Code for oil burning equipment requires the installation of a 10 (or less) micron filter in the fuel oil line. It is required that this practice be followed in order for the lifetime heat exchanger warranty to be kept intact.

2.7.7 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.

Please 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.



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.

It is also essential that the BVSO be maintained annually. For more details please refer to the instructions supplied with the device itself, as well as Section 4 of this Manual.

2.8 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 death, bodily injury and/or property damage.

2.8.1 Electronic air cleaner

Wire terminals are provided to direct 115 volts @ 0.5 Amp maximum to an Electronic Air Cleaner (EAC). Power will be available to the EAC at all times, so it must incorporate a flow proving switch if it is to be wired into the furnace control box. Most modern EACs have the required integral airflow proving switch. Wire the electronic air cleaner between terminals #5 and #2. Refer to wiring diagram, Figure 11.

2.8.2 Humidifier

The red wire from burner can be used to direct 115 volts @ 1.0 Amp maximum to the transformer powering the humidifier. The humidifier will be energised anytime the burner is operating in the "Heating Mode". Refer to wiring diagram, Figure 11.

2.8.3 Air conditioning

An air conditioning coil may be installed on the supply air side only. Also, notwithstanding the evaporator coil manufacturer's instructions, a minimum of 15 cm (6") clearance 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 Figure 11.

2.8.4 Ductwork and Filter

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

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

If a separate evaporator and blower unit is used, install appropriate 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.

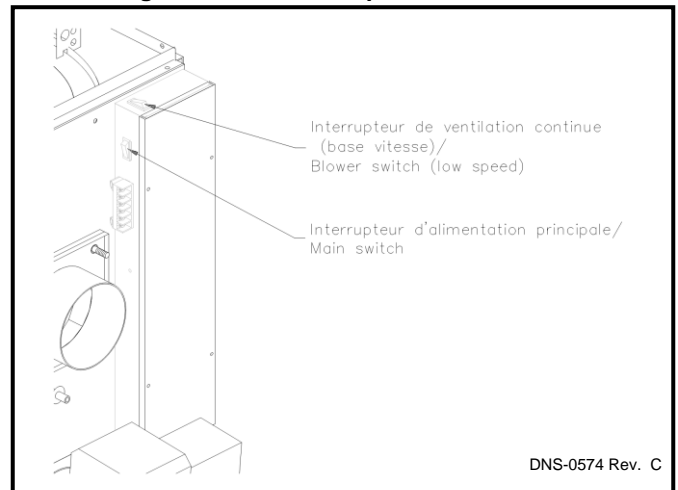
CAUTION

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

3.0 OPERATION

3.1 MANUAL OPERATION SWITCHES

Figure 2 : Manual operation switches



3.2 SEQUENCE OF OPERATION

3.2.1 Sequence of operation - Beckett AFII Side-wall venting

1. On the Beckett AFII burner, the T-T terminals have to be jumped on the primary control of the burner;
2. Normally open contact (W-R) on SPDT relay closes when thermostat calls for heat;
3. Burner motor starts and spark is established. The burner motor fan pre-purges the combustion chamber and vent for 15 to 20 seconds, establishing the combustion air pattern;
4. After the pre-purge period, solenoid valve opens allowing oil to flow through nozzle;
5. The ignition transformer spark ignites oil spray;
6. Cad cell senses flame and burner continues to fire;
7. After Fan-Limit Control heats up to the factory set point, the circulating air blower starts;
8. The circulating air blower, burner motor and ignition transformer remain on until the thermostat is satisfied. Also, the solenoid valve remains open;

Thermostat is satisfied:

9. SPDT relay contacts open, solenoid valve closes, burner fan motor post-purges the combustion chamber and vent for a pre-set time (15 seconds.). The ignition transformer also continues to spark for this time period;
10. During the post-purge cycle, the Fan-Limit Control cools down to the factory set point of 32°C (90°F) and the circulating air blower turns off.

3.2.2 Sequence of operation - Riello 40-BF Side-wall Venting

1. Normally open contact (W-R) on SPDT relay closes when thermostat calls for heat;
2. 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 will be approximately 100 psig;
3. After the pre-purge period, the solenoid valve opens, allowing oil to flow through the nozzle. At the same time, the burner motor ignition coil produces spark;
4. The ignition transformer spark ignites oil spray;
5. Cad cell senses flame and burner continues to fire. Ignition transformer ceases sparking;
6. After Fan-Limit Control heats up to the factory set point, the circulating air blower starts;
7. The circulating air blower and burner motor remain on until the thermostat is satisfied. Also, the solenoid valve remains open;

Thermostat is satisfied:

8. Relay contacts opens, solenoid valve closes, and the burner fan motor post-purges the combustion chamber and vent for a pre-set time of up to 15 seconds (5" breech model only);
9. During the post-purge cycle, the Fan-Limit Control bi-metal cools down to the factory set point of 32°C (90°F), and the circulating air blower turns off.

NOTE: With burner relay contact open, the Riello 40-BF will post-purge when 115 volt power is applied to the burner.

3.2.3 Sequence of operation - Beckett AFG and Riello 40-F, chimney venting

1. On the AFG burner, the T-T terminals have to be jumped on the primary control of the burner;
2. Normally open contact (W-R) closes when thermostat calls for heat;
3. Burner motor starts. The burner motor fan pre-purges the combustion chamber and vent for 10 to 15 seconds, establishing the combustion air pattern. After the pre-purge period, the solenoid valve opens, allowing oil to flow through nozzle. At the same time, the burner motor ignition coil produces a spark;
4. Spark ignites oil droplets;
5. Cad cell senses flame and burner continues to fire. Ignition transformer ceases sparking (Riello R40-F);
6. After Fan-Limit Control heats up to the factory set point, the circulating air blower starts;
7. The circulating air blower and burner motor remain on until the thermostat is satisfied;

Thermostat is satisfied:

8. Relay contacts open, solenoid valve closes, burner fan motor shuts down and the ignition transformer ceases sparking;

3.2.4 Sequence of operation, VTK Venting system

Normal operation

1. Before a call for heat, the contacts of the pressure switch are closed;
2. When the room thermostat calls for heat, the normally open contact W-R closes, the burner blower starts and creates suction in the intake piping circuit and pressure in the vent piping circuit;
3. The differential pressure set point of the pressure switch is not exceeded and the thermostat circuit remains closed until the call for heat has ended.

Abnormal operation

Start-up:

1. When the room thermostat calls for heat, the normally open contact W-R closes, the burner blower starts and creates suction in the intake piping circuit and pressure in the vent piping circuit;
2. If there is a blockage in the intake or vent openings to cause a pressure differential beyond the set point of the pressure switch, then the thermostat circuit is opened and the burner will go into a 15 seconds post-purge and then shut down;
3. Once the burner blower shuts down, after the post-purge, the pressure switch contacts will re-close. If the call for heat remains, the burner will re-start. If the blockage still exists, the thermostat is again opened, and the burner post-purges again. The post-purge function thus becomes an inherent anti-short cycling device;
4. The unit will essentially go into a continuous re-cycling/post-purge mode with no heat being supplied to the dwelling, which will prompt a service call;
5. If, during the re-cycling/post-purges, the blockage of the terminal is removed, the burner will immediately fire up at the end of the current post-purge cycle.

During operation:

If the terminal vent or intake openings become blocked to the point where the set point of the pressure switch is exceeded during a firing cycle, the flame will shut down and the burner will go into the indefinite recycling post-purge mode as described above, until the blockage is removed.

3.3 CHECKS AND ADJUSTMENTS

3.3.1 General

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

Open the oil bleed port screw and start the burner. Allow the oil to drain into a container for at least 10 seconds. The oil should flow absolutely free of white streaks or air bubbles to indicate that no air is being drawn into the suction side of the oil piping and pump. Then slowly close and tighten the bleed screw. Fire the burner. Adjust the oil pressure as indicated in Tables 3 to 5.

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 in Tables 3 to 5 before firing. These are rough adjustments but they will ensure that the burner will start and run smoke-free in advance of the final adjustments to be made.

3.3.2 Restart after burner failure

1. Set thermostat lower than the room temperature;
2. Press the reset button on the burner primary control (relay);
3. With side-wall venting and Riello burner, set thermostat higher than the room temperature for 10 seconds, then set lower than room temperature. This will start pre-purge cycle. Repeat twice;
4. Set thermostat higher than the room temperature;
5. 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. Always keep the supply valve closed if the burner is shut down for an extended period of time.

3.3.3 Combustion chamber curing

Some moisture and binders remain in the ceramic combustion chambers after fabrication. It is important to clear the chamber of this residue before testing. If you smoke test before curing, the instrument may become damaged. To cure the chamber, run the unit for 3 consecutive cycles, with 3 minutes of elapsed time in between each cycle. The burner must operate for about 3 minutes per cycle. The exhaust will have a pungent odour and produce a white cloud of steam.

3.3.4 Smoke / CO₂ test

1. On chimney installations, pierce a test hole in the smoke pipe 18" above the furnace breech. On side-wall vented installations, remove the threaded cap from the extended test pipe that is welded into the 4-bolt breech plate. Insert the smoke test instrument probe into the open hole;
2. From a cold start, let the unit operate during 5 to 10 minutes;
3. Set the burner air setting until just a trace of smoke results (#1 on the Bacharach scale);
4. Take a CO₂ sample at the same test location where the #1 smoke reading was taken and make note of it. Example: 13.8% of CO₂ or 2.5% of O₂;
5. 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 #1 smoke. Example: 12.3% or CO₂ or 4.5% of O₂;
6. This method of adjusting the burner will result in clean combustion and ensure the proper functioning of the system.

3.3.5 Perform the supply air temperature rise test

1. Operate the burner for at least 10 minutes;
2. Measure the temperature of the air in the return air plenum;
3. Measure the temperature of the air in the largest trunk coming off the supply air plenum, just outside the range of radiant heat coming off the heat exchanger; 30 cm (12") away from the plenum on the main take-off is usually sufficient;
4. The temperature rise is calculated by subtracting the return air temperature from the supply air temperature;
5. If the temperature rise exceeds the temperature specified in Tables 4.1 to 4.3, change to the next higher blower speed tap until the temperature rise falls to this temperature or below. If the excessive temperature rise cannot be reduced by increasing fan speed, investigate for ductwork restriction(s), dirty or improper air filter, overfiring caused by excessive pump pressure, or improper nozzle sizing.

3.3.6 Vent temperature test (chimney installation)

1. After 5 to 10 minutes of operation, place a thermometer in the test hole located in the breech pipe;
2. The vent temperature should be between 204 and 302°C (400 and 575°F). If not, check for improper air temperature rise, pump pressure, nozzle size, or for a badly sooted heat exchanger.

3.3.7 Overfire pressure test procedure

The overfire draft that is taken through the observation port, located above the burner, is a measurement necessary to determine if there is a blockage in the heat exchanger or the flue pipe. Refer to the Technical Specifications in this manual for overfire 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.

3.3.8 Fan-Limit adjustment

Modification of the "FAN ON" and "HI" limit settings on the Fan-Limit can cause a malfunctioning of the furnace and result in premature wear of the heat exchanger.

Please refer to the different adjustment values in Figure 3.



CAUTION

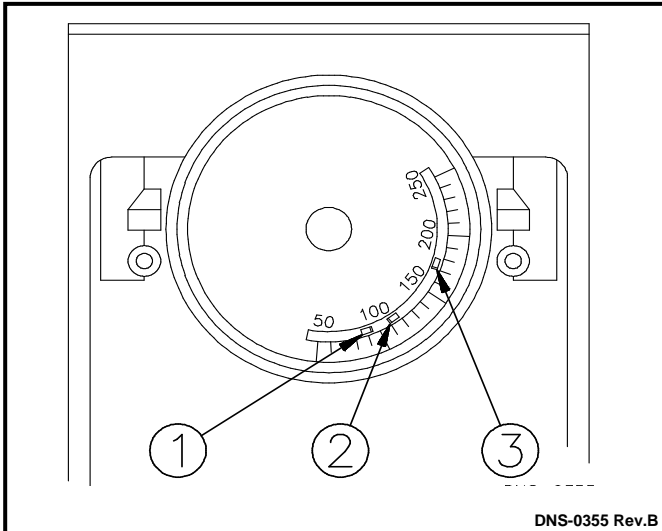
Modification of the factory set limits will void the warranty.

3.3.9 Fan-Limit control check

After operating the furnace for at least 15 minutes, restrict the return air supply by blocking the filters or the return air register and allow the furnace to shut off on High Limit. The burner will shut off but the blower will continue to run.

Remove the obstruction and the burner should restart after a few minutes.

Figure 3 : Fan-limit



DNS-0355 Rev.B

1	"FAN OFF" Limit	90°F
2	"FAN ON" Limit	
	Model : OLR160	110°F
	Model : OUF105, OLF105, OLR105, OUF160, NOUF105 & NOLF105	130°F
3	"HI" Limit	
	Model : OLR160	170°F
	Model : OUF105, OLF105, OLR105, NOUF105 & NOLF105	180°F
	Model : OUF160	220°F

3.3.10 Blocked intake/blocked vent test (VTK)

On side-wall vented furnaces, the VTK venting system incorporates a safety shutdown system that will shut the burner down before #1 smoke occurs due to the presence of a blocked intake or blocked vent outlet. Test the system as follows:

1. Ensure that the furnace has been running for at least 10 minutes;
2. Gradually block the intake. The burner flame should shut down before a #1 smoke reading occurs;
3. Gradually block the vent outlet. The burner flame should shut down before a #1 smoke reading occurs;
4. If the burner does not shut down before a #1 smoke occurs, ensure that the burner is set up according to Part 2, section 3.4 (2.3.4). Perform the CO₂/ Smoke Test, and allow for the 1.5% CO₂ operating play required by the instructions;
5. If the burner still does not shut down before a #1 smoke occurs, check for a blockage of the pressure hose, or at the hose connection points.

IMPORTANT

The VTK safety shutdown system will shut down the burner flame during a blocked intake or blocked vent condition if and only if, the burner has been set up and calibrated in accordance with Tables 3 or 5. Perform the CO₂/ Smoke Test. For instance, if the burner is adjusted and final-set to a #1 smoke condition during normal operation, the burner flame cannot possibly shut down before #1 smoke occurs during a blockage condition.

3.3.11 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

4.1 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.

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

CAUTION

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

WARNING

ELECTRICAL SHOCK HAZARD.
Turn OFF power to furnace before any disassembly or servicing.
Failure to do so can result in bodily injury and/or death, property damage.

Before calling for service, check the following:

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

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

4.2 HEAT EXCHANGER

The entire heat exchanger should be inspected annually for soot accumulation. If the burner is operating normally there should be very little soot accumulation. If the heat exchanger requires scale removal, use a wire brush first, to loosen the scale and then vacuum the soot and scale that has fallen into the secondary heat exchanger (radiator) section. You will find that a 36" long flexible hose attachment will be helpful to reach into the back of the radiator. A piece of 1/2" flexible gas connector, or a piece of 1/2" liquid-tight vinyl jacket metallic electrical conduit works well as a makeshift device.

4.2.1 Cleaning the heat exchanger

Remove the 4-bolt flange from the front of the furnace to expose the clean-out port and check for soot deposits. If there is very little soot in the radiator section visible from the clean-out port, you will not need to clean it. However, if you notice scaling in the radiator, you should remove it.

The wrap-around radiator can now be cleaned entirely from the front inspection port. The furnace also has external clean-out ports so the soot does not fall into the fan compartment during the cleaning operation.

IMPORTANT

DO NOT VACUUM THE CERAMIC CHAMBERS—they are easily damaged.

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.

4.2.2 Refractory firepot

Remove the burner and check the firepot.

IMPORTANT

This furnace has a fibre type refractory combustion chamber. Normal servicing of this unit does not require cleaning of the combustion chamber. If cleaning of the pot should be required, use extreme care. After firing, the pot becomes very fragile. Do not use any commercially available soot removers.

If the pot is damaged, it must be replaced. A damaged pot could lead to premature heat exchanger failure. Cracking of the firepot is normal, however, replace the pot only if the cracks have propagated more than 2/3 the way through the wall thickness. The average wall thickness of the firepot is 19 mm (3/4").



CAUTION

If you observe the red warning light on the burner, push ONLY once to try and restart. If the burner does not start, call a qualified service technician. Do NOT press the button again.

Flooding of the firepot

Flooding can occur when the oil primary control has been reset a number of times in a no-heat situation. Each time oil is fired into the pot and does not ignite, it is absorbed into the pot. Even if the burner is removed and the pot is felt for wetness, it is difficult to assess the degree of oil absorption by the pot.

There is only one way to properly service a flooded firepot, and that is to replace it.

Self-aligning firepot

The primary heat exchanger of the furnace is comprised of an upper and lower half. The lower half is essentially a "can" that contains a self-aligning firepot. The firepot fits into the bottom half in one direction only.

Removing the firepot

The firepot is seldom replaced, but when it must be replaced one must simply:

1. Remove the burner;
2. Remove the burner Limit Control;
3. Remove the breech plate;
4. Remove the front panel;
5. Remove the brass nuts on the stainless steel heat exchanger studs;
6. Pry the bottom half of the heat exchanger apart by using the designated prying tabs;
7. Remove the bottom half of the heat exchanger through the front of the furnace;
8. Pull the firepot up and out of the bottom half of the heat exchanger;
9. Remove the old sealing gasket from the flange of the upper half of the heat exchanger;
10. Scrape any residual gasket material off the matching flanges of the heat exchanger.

Replacing the firepot

1. Align the slot at the front part of the firepot with the burner tube sleeve and gently lower the firepot into the bottom half of the heat exchanger;
2. Holding the firepot near the perimeter, gently push the firepot all the way into the bottom half of the heat exchanger until it is properly seated;
3. Thoroughly wet the gasket with water using a spray pump bottle, position the tabs over the studs, and push the gasket upward against the sealing flange of the upper half of the heat exchanger;
4. Install the brass nuts on the studs by engaging only 2 or 3 threads;
5. Position the bottom half of the heat exchanger under the upper half and align the bottom half so that the slots in the bolting tabs engage the stainless steel studs. There is no further need to hold onto the bottom half as it will now be suspended on the stud nuts;
6. Push upward on the housing and thread the nuts finger-tight as far as possible;
7. Intermittently tighten the brass nuts with a wrench in a sequence that will pull the heat exchanger halves together evenly. Tighten all nuts to 90 inch-lbs torque once and then alternately re-tighten all nuts again to 100 inch-lb. **THE RE-TIGHTENING SEQUENCE IS ABSOLUTELY NECESSARY TO ENSURE A TIGHT JOINT;**
8. Re-assemble the front panel, breech plate, Limit Control and burner in reverse sequence to their removal;
9. Follow the instructions for starting the burner for the first time to cure the firepot and perform combustion checks.

4.3 BURNER

4.3.1 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.

4.3.2 Nozzle

Replace the nozzle with the one specified in Tables 3 to 5.

4.4 OIL FILTER

4.4.1 Tank filter

The tank filter should be replaced as required.

4.4.2 Secondary filter

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

4.5 AIR FILTERS

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

4.6 MOTOR LUBRICATION

Do NOT lubricate the oil burner motor or the direct drive blower motor as it is permanently lubricated.

4.7 CAS-2B COMBUSTION AIR KIT (chimney venting)

If used, check the CAS-2B combustion air kit for proper operation. Check to see that the inlet screen is not plugged. Block the air inlet completely and ensure that a zero smoke reading results. If a zero smoke reading is not obtained, set up the burner as indicated in Tables 3 to 5.

Gradually block off the intake. The CO₂ should increase to a maximum of 0.5 percentage points at the fully blocked condition. If not, check that the VRV gate is pivoting freely and that the pivot rod is in a horizontal position. Also, check that the counterweight has been properly adjusted in accordance with CAS-2B installation instructions.

4.8 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: _____

Gross stack temperature: _____ °F

Ambient temperature: _____ °F

Chimney draft : _____ " W.C.

Overfire draft : _____ " W.C.

Test performed
by: _____

Table 3 : Technical Specifications, OLBR / OLR**

Model :	OLB53R / OLR105				OLB64R / OLR160		
RATING AND PERFORMANCE							
Firing rate (USGPH)	0.50	0.63	0.75	0.72	0.85	0.97	1.14
Input (BTU/h)	70 000	88 200	105 000	101 000	119 000	135 800	159 600
Minimum - maximum temperature rise	11 - 24°C (52 - 75°F)				10 - 27°C (50 - 80°F)		
Flue draft, (Chimney), (Side-wall)	(-0.035" to -0.06") (+0.04" to +0.16")				(-0.035" to -0.06") (+0.04" to +0.22")		
Overfire pressure (chimney), (Side-wall)	(0.00" to +0.035") (+0.10" to +0.25")				(0.00" to +0.04") (+0.10" to +0.25")		
BECKETT BURNER, CHIMNEY INSTALLATION / Insertion							
AFG with F0 head / 5 1/8"							
Heating capacity (BTU/h)	58 000	72 000	85 000		97 000	110 000	131 000
Low firing rate baffle	Yes	Yes	No		No	No	No
Static disc, model	2 3/4 #3383	2 3/4 #3383	2 3/4 #3383		2 3/4 #3383	2 3/4 #3383	2 3/4 #3383
Nozzle (Delavan)***	0.50 - 70A	0.50 - 70A	0.60 - 70B		0.75 - 70B	0.85 - 70B	1.00 - 70B
Pump pressure (PSIG)*	100	156	156		130	130	130
Combustion air adjustment (band/shutter)	0 / 4.5	0 / 8	0 / 7.5		0 / 5	0 / 6.5	0 / 10
AFUE % (From CSA B212 standard and Canadian regulation)**	85.7	85.1	84.0		84.5	83.8	82.2
AFUE % (From ASHRAE 103 standard and US regulation)**	85.4	83.9	83.5		83.3	83.2	81.0 ‡
RIELLO BURNER, CHIMNEY INSTALLATION / Insertion							
40-F3 / 5 3/16"							
Heating capacity (BTU/h)	59 000	73 000	86 000		97 000	111 000	131 000
Nozzle (Delavan)***	0.40 - 60A	0.50 - 60A	0.60 - 60A		0.75 - 70B	0.85 - 70B	1.00 - 70B
Pump pressure (PSIG)*	156	156	156		130	130	130
Combustion air adjustment (turbulator / damper)	0 / 2	0 / 3	0 / 4		1 / 2	1 / 2.5	1 / 3
AFUE % (From CSA B212 standard and Canadian regulation)**	86.8	85.0	84.3		85.1	84.1	82.6
AFUE % (From ASHRAE 103 standard and US regulation)**	85.7	83.9	83.1		83.6	83.5	81.4 ‡
BECKETT BURNER, SIDE-WALL INSTALLATION / Insertion							
AFI-85 / 4 15/16"							
Heating capacity (BTU/h)	59 000	73 000	85 000		98 000	111 000	128 000
Nozzle (Delavan)***	0.50 - 60W	0.50 - 60W	0.60 - 60W		0.75 - 70B	0.85 - 70B	1.00 - 70B
Pump pressure (PSIG)*	130	140	160		130	130	130
Combustion air adjustment (screw / dial) or (dial only)	3 / 1.5	3 / 3	3 / 4.5		2.75	4.25	6.75
AFUE % (From CSA B212 standard and Canadian regulation)**	86.4	85.6	83.7		82.5	81.9	80.4
AFUE % (From ASHRAE 103 standard and US regulation)**	85.9	85.0	83.0		79.6 ‡	80.3 ‡	79.0 ‡
RIELLO BURNER, SIDE-WALL INSTALLATION / Insertion							
40-BF3 w/ AL1009 post purge ctrl / 5 3/16"							
Heating capacity (BTU/h)	59 000	74 000		82 000	97 000	112 000	129 000
Nozzle (Delavan)***	0.50 - 60W	0.50 - 60W		0.60 - 60W	0.75 - 70B	0.85 - 70B	1.00 - 70B
Pump pressure (PSIG)*	135	140		155	130	130	130
Combustion air adjustment (turbulator / damper)	0 / 3	0 / 6		0 / 7.5	1 / 3	1 / 4	2 / 4.5
AFUE % (From CSA B212 standard and Canadian regulation)**	86.4	85.3		83.8	84.1	82.6	81.3
AFUE % (From ASHRAE 103 standard and US regulation)**	85.1	84.0		83.5	83.0	79.7 ‡	78.7 ‡
ELECTRICAL SYSTEM							
Volts - Hertz - Phase	115 - 60 - 1				115 - 60 - 1		
Operating voltage range (Volts)	104 - 132				104 - 132		
Electrical load (Amps)	12.2				15.7		
Minimum ampacity for wiring sizing	13.7				18.1		
Max. fuse size (Amps)	15				20		
Control transformer	40 VA				40 VA		
Ext. control power available, cooling and accessories	30 VA				30VA		
BLOWER DATA							
Blower speed at 0.50" W.C. static pressure	MED-LO	MED-HI	HIGH	HIGH	MED-LO	MED-HI	HIGH
Blower speed at 0.25" W.C. static pressure	LOW	MED-HI	MED-HI	MED-HI	MED-LO	MED-HI	MED-HI
Maximum cooling, speed	LOW	MED-LO	MED-HI	HIGH	MED-LO	MED-HI	HIGH
Maximum cooling, tons @ 0.50" W.C.	1.5	2	2.5	3	3.5	4	5
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 (in.)	(1) 20 X 20				OLR		

‡ = NON-AVAILABLE IN UNITED STATES

* INPUT & OUTPUT ADJUSTMENT

- Pump pressure can be adjusted to maintain proper firing rate.
- Increase pump pressure if flue gases temperature is under 400°F.
- Adjust the total flue gas temperature between 400°F and 575°F (330°F and 505°F net approximately)

** AFUE values established after minimum 20 hours of operation.

*** Default installed NOZZLE in bold characters.

Table 4 : Technical Specifications, OHB / OUF & NOUF

Model :	(N)OHB53F / (N)OUF105				OHB64F / OUF160		
RATING AND PERFORMANCE							
Firing rate (USGPH)	0.50	0.63	0.75	0.72	0.85	0.97	1.14
Input (BTU/h)	70 000	88 200	105 000	100 800	119 000	135 800	159 600
Minimum - maximum temperature rise	11 - 24°C (52 - 75°F)				10 - 27°C (50 - 80°F)		
Flue draft, (Chimney), (Side-wall)	(-0.035" to -0.06") (+0.04" to +0.16")				(-0.035" to -0.06") (+0.04" to +0.22")		
Overfire pressure (chimney), (Side-wall)	(0.00" to +0.035") (+0.10" to +0.25")				(0.00" to +0.04") (+0.10" to +0.25")		
BECKETT BURNER, CHIMNEY INSTALLATION / Insertion		AFG with F0 head / 5 1/8"			AFG with F3 head / 7"		
Heating capacity (BTU/h)	58 000	73 000	87 000		97 000	110 000	132 000
Low firing rate baffle	Yes	Yes	No		No	No	No
Static disc, model	2 3/4 #3383	2 3/4 #3383	2 3/4 #3383		2 3/4 #3383	2 3/4 #3383	2 3/4 #3383
Nozzle (Delavan)***	0.50 - 70A	0.50 - 70A	0.60 - 70B		0.75 - 70B	0.85 - 70B	1.00 - 70B
Pump pressure (PSIG)*	100	156	156		130	130	130
Combustion air adjustment (band/shutter)	0 / 4.5	0 / 8	0 / 7.5		0 / 5	0 / 6.5	0 / 10
AFUE % (From CSA B212 standard and Canadian regulation)**	85.9	85.2	82.9		85.1	83.9	83.0
AFUE % (From ASHRAE 103 standard and US regulation)**	84.9	83.2	81.3 ‡		83.8	83.4	81.7 ‡
RIELLO 40-F BURNER, CHIMNEY INSTALLATION / Insertion		40-F3 / 5 3/16"			40-F5 / 7"		
Heating capacity (BTU/h)	58 000	72 000	87 000		97 000	110 000	131 000
Nozzle (Delavan)***	0.40 - 60A	0.50 - 60A	0.60 - 60A		0.75 - 70B	0.85 - 70B	1.00 - 70B
Pump pressure (PSIG)*	156	156	156		130	130	130
Combustion air adjustment (turbulator / damper)	0 / 2	0 / 3	0 / 4		0 / 2.5	0 / 2.8	0 / 3.9
AFUE % (From CSA B212 standard and Canadian regulation)**	85.8	83.7	83.0		85.4	83.6	82.3
AFUE % (From ASHRAE 103 standard and US regulation)**	84.6	83.4	80.8 ‡		84.3	83.4	81.4 ‡
BECKETT BURNER, SIDE-WALL INSTALLATION / Insertion		AFII-85 / 4 15/16"			AFII-150 / 7"		
Heating capacity (BTU/h)	58 000	72 000	84 000		97 000	113 000	129 000
Nozzle (Delavan)***	0.50 - 60W	0.50 - 60W	0.60 - 60W		0.75 - 70B	0.85 - 70B	1.00 - 70B
Pump pressure (PSIG)*	130	140	160		130	130	130
Combustion air adjustment (screw / dial) or (dial only)	3 / 1.5	3 / 3	3 / 4.5		2.75	4.25	6.0
AFUE % (From CSA B212 standard and Canadian regulation)**	84.2	82.2	80.9		83.8	83.5	81.4
AFUE % (From ASHRAE 103 standard and US regulation)**	83.8	81.3 ‡	79.5 ‡		83.2	82.0 ‡	80.1 ‡
RIELLO 40-BF BURNER, SIDE-WALL INSTALLATION / Insertion		40-BF3 w/ AL1009 post purge ctrl / 5 3/16"			40-BF5 / 7"		
Heating capacity (BTU/h)	58 000	73 000		82 000	97 000	112 000	129 000
Nozzle (Delavan)***	0.50 - 60W	0.50 - 60W		0.60 - 60W	0.75 - 70B	0.85 - 70B	1.00 - 70B
Pump pressure (PSIG)*	135	140		155	130	130	130
Combustion air adjustment (turbulator / damper)	0 / 3	0 / 6		0 / 7.5	0 / 3.75	0 / 4	0 / 4.875
AFUE % (From CSA B212 standard and Canadian regulation)**	84.4	83.0		82.1	83.2	82.7	81.3
AFUE % (From ASHRAE 103 standard and US regulation)**	84.3	81.5 ‡		80.7 ‡	83.1	81.8 ‡	80.0 ‡
ELECTRICAL SYSTEM							
Volts - Hertz - Phase	115 - 60 - 1				115 - 60 - 1		
Operating voltage range (Volts)	104 - 132				104 - 132		
Electrical load (Amps)	15.4				16.9		
Minimum ampacity for wiring sizing	17.7				19.5		
Max. fuse size (Amps)	20				20		
Control transformer	40 VA				40 VA		
Ext. control power available, cooling and accessories	30 VA				30 VA		
BLOWER DATA							
Blower speed at 0.50" W.C. static pressure	LOW	LOW	MED-HI	MED-HI	MED-LO	MED-HI	HIGH
Blower speed at 0.25" W.C. static pressure	LOW	LOW	MED-LO	MED-LO	MED-LO	MED-LO	MED-HI
Maximum cooling, speed	LOW	MED-LO	MED-HI	HIGH	MED-LO	MED-HI	HIGH
Maximum cooling, tons @ 0.50" W.C.	2	2.5	2.5	3	3.5	4	5
Motor (HP) / number of speeds	1/2 HP / 4 speeds				1 HP / 4 speeds		
Blower wheel size (in.)	10 X 10				12 X 10		
Filter quantity and size (in.)	(1) 20 X 20				(1) 24 X 24		

‡ = NON-AVAILABLE IN UNITED STATES

* INPUT & OUTPUT ADJUSTMENT

- Pump pressure can be adjusted to maintain proper firing rate.

- Increase pump pressure if flue gases temperature is under 400°F.

- Adjust the total flue gas temperature between 400°F and 575°F (330°F and 505°F net approximately)

** AFUE values established after minimum 20 hours of operation.

*** Default installed NOZZLE in bold characters.

Table 5 : Technical Specifications, OLB53F / OLF105 & NOLF105

Model :	(N)OLB53F / (N)OLF105			
RATING AND PERFORMANCE				
Firing rate (USGPH)	0.50	0.63	0.75	0.72
Input (BTU/h)	70 000	88 200	105 000	100 800
Minimum - maximum temperature rise	11 - 24°C (52 - 75°F)			
Flue draft, (Chimney), (Side-wall)	(-0.035" to -0.06") (+0.04" to +0.16")			
Overfire pressure (chimney), (Side-wall)	(0.00" to +0.035") (+0.10" to +0.25")			
BECKETT BURNER, CHIMNEY INSTALLATION / Insertion				
AFG with F0 head / 5 1/8"				
Heating capacity (BTU/h)	58 000	72 000	87 000	
Low firing rate baffle	Yes	Yes	No	
Static disc, model	2 3/4 #3383	2 3/4 #3383	2 3/4 #3383	
Nozzle (Delavan)***	0.50 - 70A	0.50 - 70A	0.60 - 70B	
Pump pressure (PSIG)*	100	156	156	
Combustion air adjustment (band/shutter)	0 / 4.5	0 / 8	0 / 7.5	
AFUE % (From CSA B212 standard and Canadian regulation)**	85.2	83.4	83.5	
AFUE % (From ASHRAE 103 standard and US regulation)**	85.2	83.4	79.6 ‡	
RIELLO BURNER, CHIMNEY INSTALLATION / Insertion				
40-F3 / 5 3/16"				
Heating capacity (BTU/h)	59 000	73 000	86 000	
Nozzle (Delavan)***	0.40 - 60A	0.50 - 60A	0.60 - 60A	
Pump pressure (PSIG)*	156	156	156	
Combustion air adjustment (turbulator / damper)	0 / 2	0 / 3	0 / 4	
AFUE % (From CSA B212 standard and Canadian regulation)**	85.9	83.5	82.2	
AFUE % (From ASHRAE 103 standard and US regulation)**	86.0	83.4	82.3 ‡	
BECKETT BURNER, SIDE-WALL INSTALLATION / Insertion				
AFII-85 / 4 15/16"				
Heating capacity (BTU/h)	57 000	73 000	85 000	
Nozzle (Delavan)****	0.50 - 60W	0.50 - 60W	0.60 - 60W	
Pump pressure (PSIG)*	130	140	160	
Combustion air adjustment (screw / dial) or (dial only)	3 / 1.5	3 / 3	3 / 4.5	
AFUE % (From CSA B212 standard and Canadian regulation)**	84.2	83.0	81.9	
AFUE % (From ASHRAE 103 standard and US regulation)**	83.1	81.5 ‡	78.7 ‡	
RIELLO BURNER, SIDE-WALL INSTALLATION / Insertion				
40-BF3 with AL1009 post purge control				
Heating capacity (BTU/h)	57 000	72 000		82 000
Nozzle (Delavan)***	0.50 - 60W	0.50 - 60W		0.60 - 60W
Pump pressure (PSIG)*	135	140		155
Combustion air adjustment (turbulator / damper)	0 / 3	0 / 6		0 / 7.5
AFUE % (From CSA B212 standard and Canadian regulation)**	84.8	82.9		82.0
AFUE % (From ASHRAE 103 standard and US regulation)**	84.7	83.2		82.0 ‡
ELECTRICAL SYSTEM				
Volts - Hertz - Phase	115 - 60 - 1			
Operating voltage range (Volts)	104 - 132			
Electrical load (Amps)	12.2			
Minimum ampacity for wiring sizing	13.7			
Max. fuse size (Amps)	15			
Control transformer	40 VA			
Ext. control power available, cooling and accessories	30 VA			
BLOWER DATA				
Blower speed at 0.50" W.C. static pressure	LOW	MED-HI	HIGH	HIGH
Blower speed at 0.25" W.C. static pressure	LOW	MED-HI	HIGH	HIGH
Maximum cooling, speed	LOW	MED-LO	MED-HI	HIGH
Maximum cooling, tons @ 0.50" W.C.	1.5	2	2.5	3
Motor (HP) / number of speeds	1/3 HP / 4 speeds			
Blower wheel size (in.)	10 X 10			
Filter quantity and size (in.)	(1) 20 X 20			

‡ = NON-AVAILABLE IN UNITED STATES

* INPUT & OUTPUT ADJUSTMENT

- Pump pressure can be adjusted to maintain proper firing rate.

- Increase pump pressure if flue gases temperature is under 400°F.

- Adjust the total flue gas temperature between 400°F and 575°F (330°F and 505°F net approximately)

** AFUE values established after minimum 20 hours of operation.

*** Default installed NOZZLE in bold characters.

Table 6 : Air delivery - CFM with air filter, OLBR / OLR**

SPEED	OLB53R / OLR105							OLB64R / OLR160						
	EXTERNAL STATIC PRESSURE WITH AIR FILTER													
	0.1"	0.2"	0.3"	0.4"	0.5"	0.6"	0.7"	0.1"	0.2"	0.3"	0.4"	0.5"	0.6"	0.7"
LOW	940	880	820	760	700	640	580	1148	1116	1084	1052	1020	988	956
MED-LO	1054	978	902	826	750	674	598	1366	1362	1358	1354	1350	1346	1342
MED-HI	1144	1108	1072	1036	1000	964	928	1676	1642	1608	1574	1540	1506	1472
HIGH	1444	1408	1372	1336	1300	1264	1228	2250	2150	2050	1950	1850	1750	1650

Table 7 : Air delivery - CFM with air filter, OHBF / OUF & NOUF**

SPEED	OHB53F / OUF105 & NOUF105							OHB64F / OUF160						
	EXTERNAL STATIC PRESSURE WITH AIR FILTER													
	0.1"	0.2"	0.3"	0.4"	0.5"	0.6"	0.7"	0.1"	0.2"	0.3"	0.4"	0.5"	0.6"	0.7"
LOW	984	968	952	936	920	904	888	1134	1098	1062	1026	990	954	918
MED-LO	1160	1120	1080	1040	1000	960	920	1374	1358	1342	1326	1310	1294	1278
MED-HI	1390	1330	1270	1210	1150	1090	1030	1662	1624	1586	1548	1510	1472	1434
HIGH	1670	1590	1510	1430	1350	1270	1190	2201	2107	2013	1919	1825	1731	1637

Table 8 : Air delivery - CFM with air filter, OLB53F / OLF105 & NOLF105

SPEED	OLB53F / OLF105 & NOLF105						
	EXTERNAL STATIC PRESSURE WITH AIR FILTER						
	0.1"	0.2"	0.3"	0.4"	0.5"	0.6"	0.7"
LOW	882	854	826	798	770	742	714
MED-LO	1056	992	928	864	800	736	672
MED-HI	1092	1064	1036	1008	980	952	924
HIGH	1360	1320	1280	1240	1200	1160	1120

Figure 4 : OLB53R / OLR105

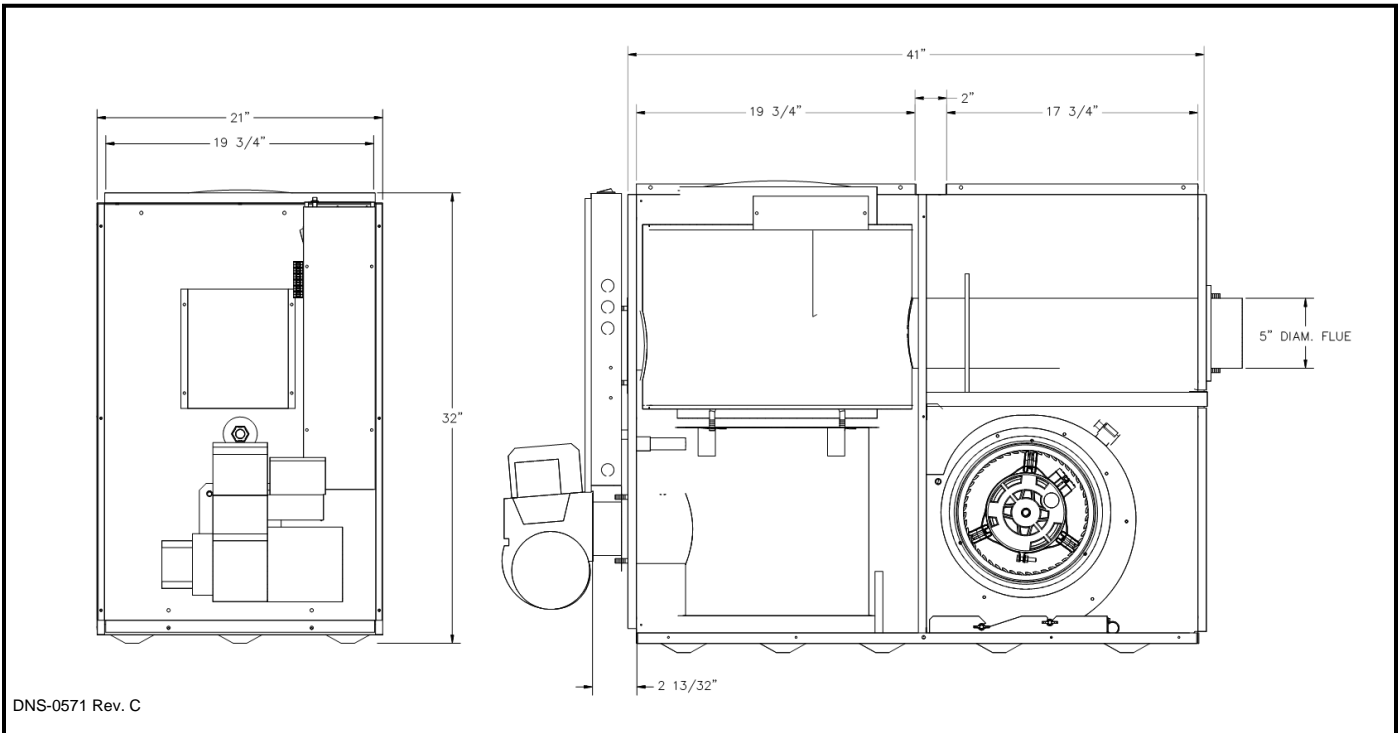


Figure 5 : OLB64R / OLR160

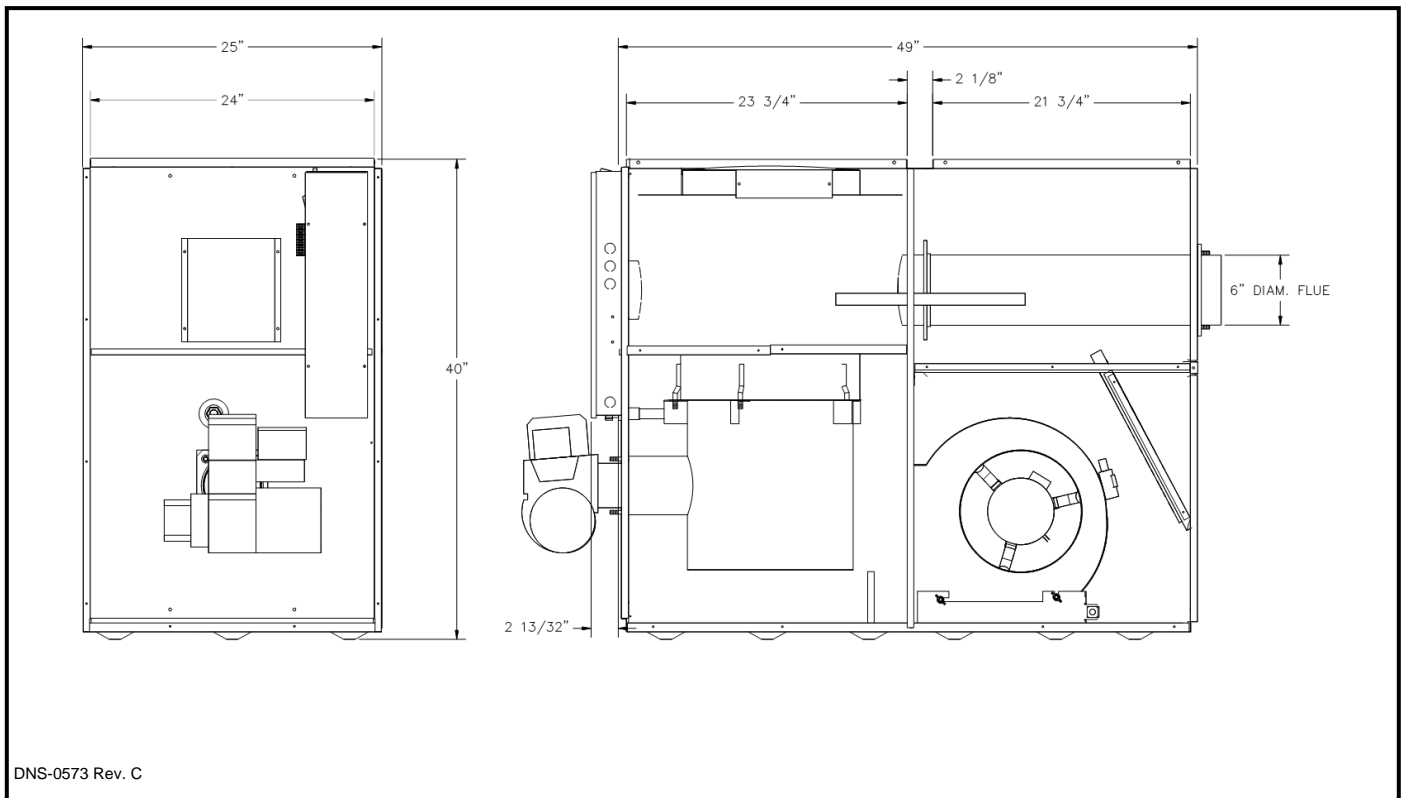


Figure 6 : OHB53F / OUF105

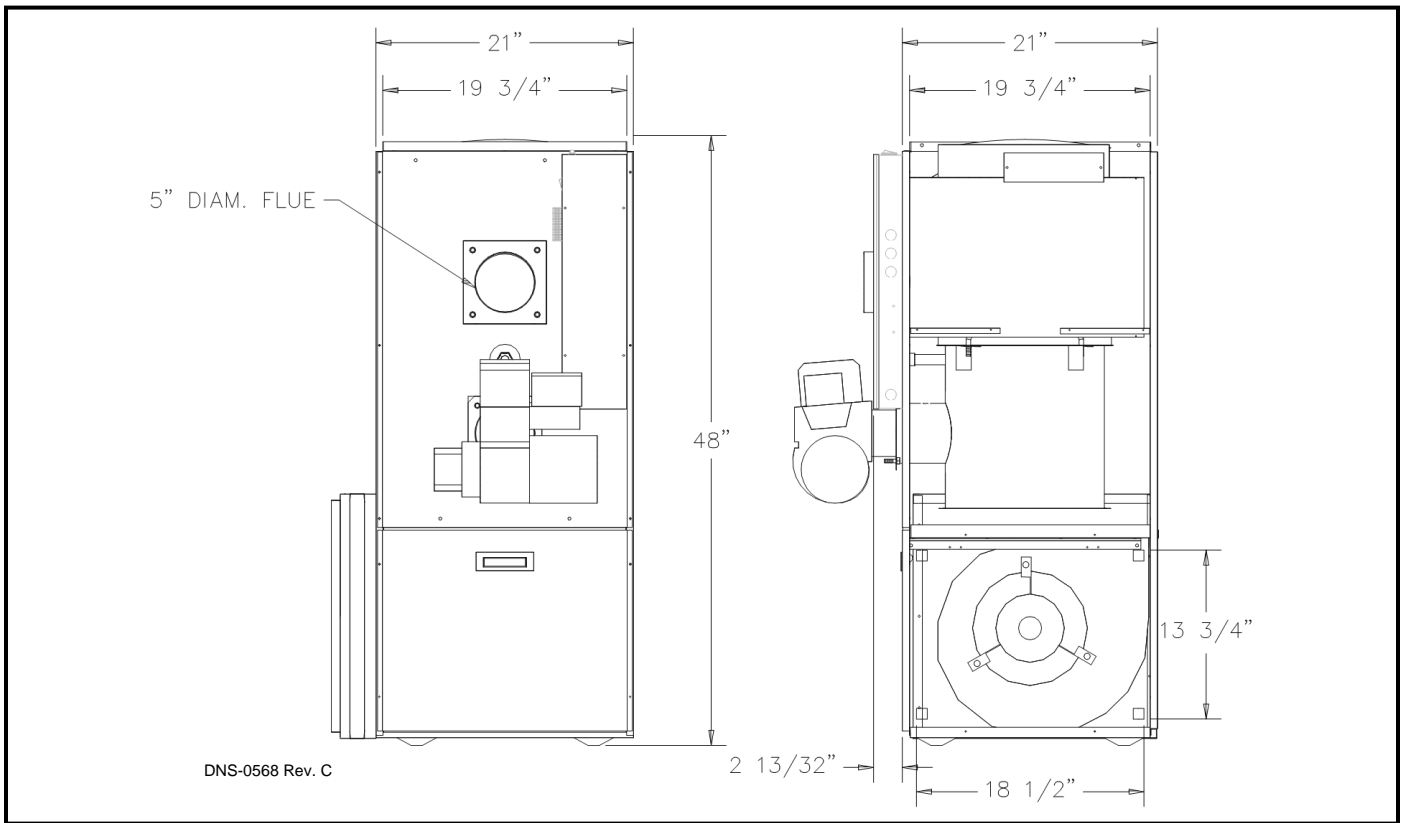


Figure 7 : OHB64F / OUF160

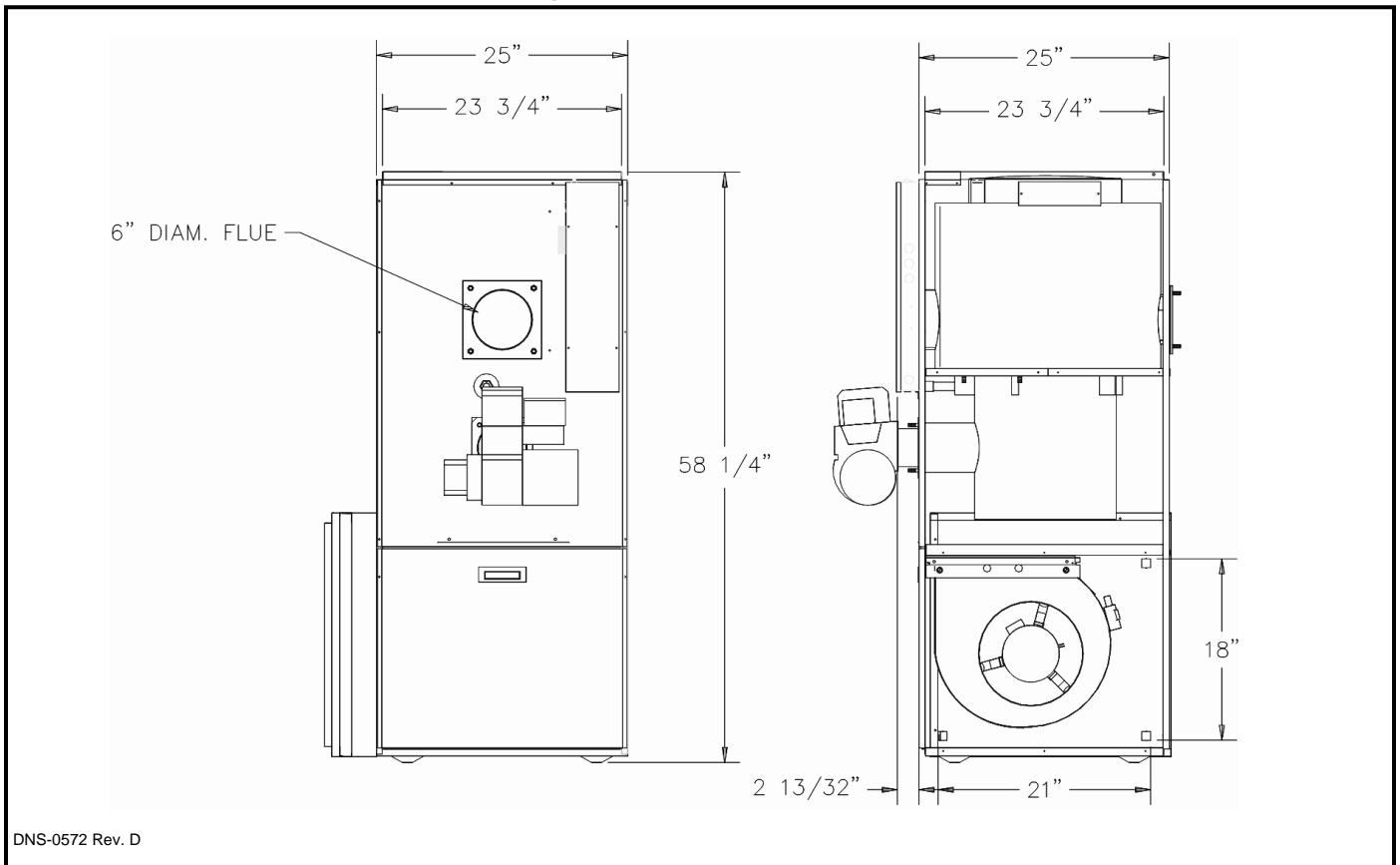


Figure 8 : OLB53F / OLF105

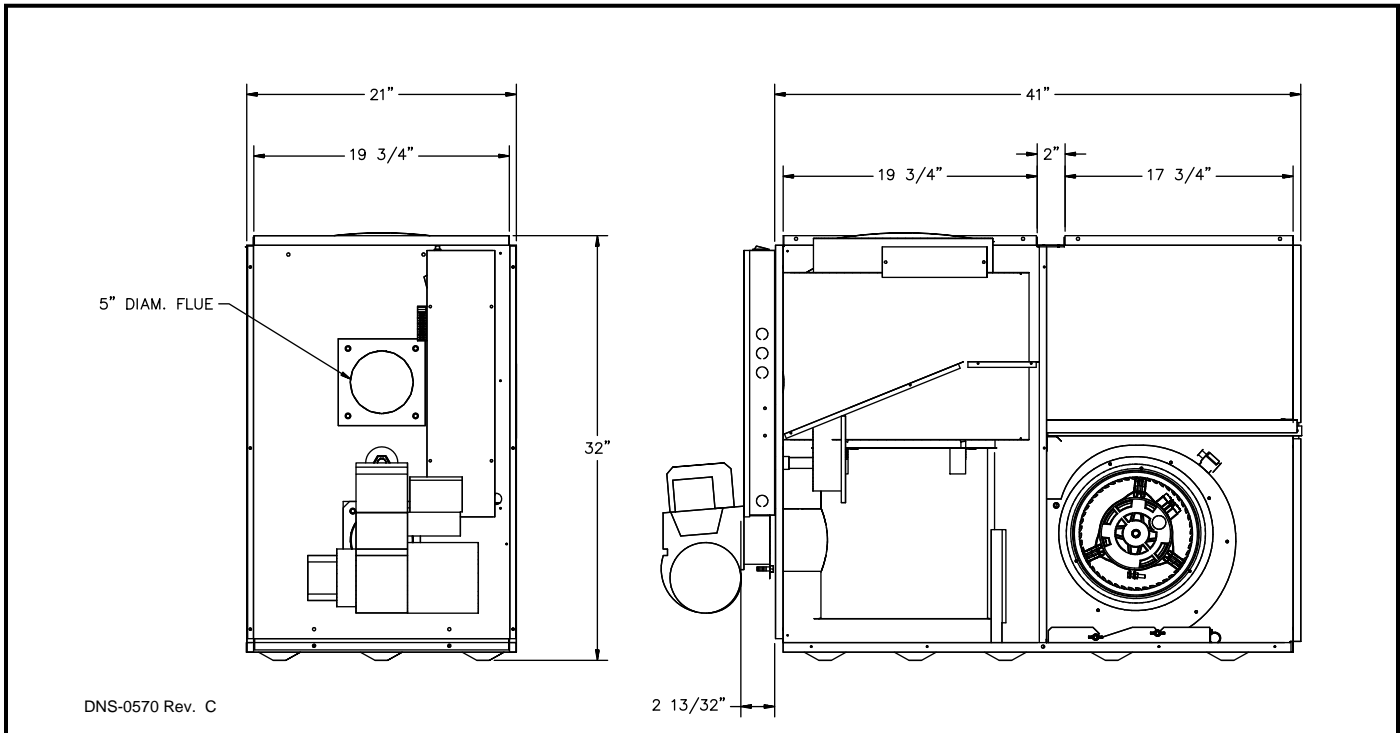


Figure 9 : NOHB53F - NOUF105

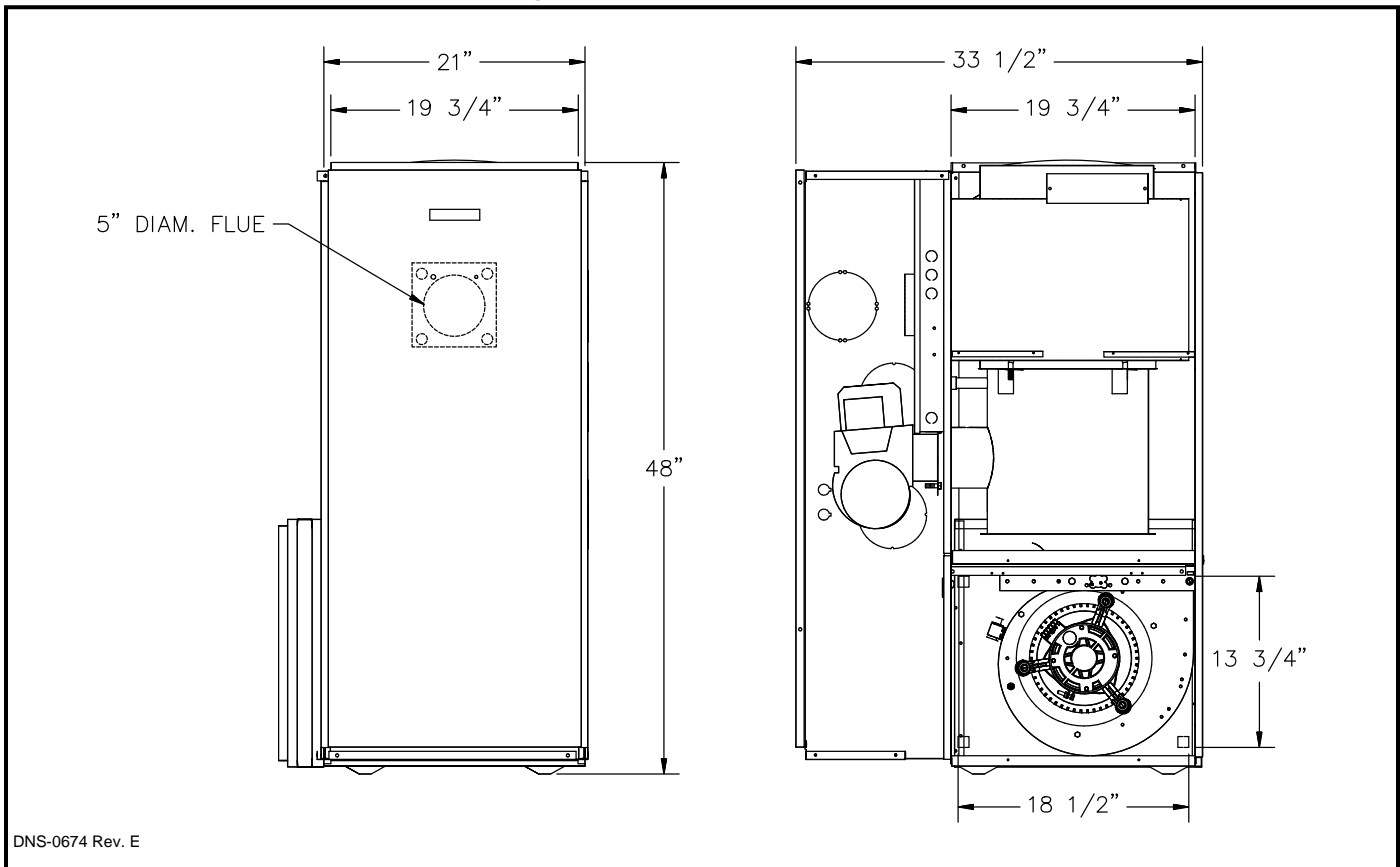


Figure 10 : NOLB53F - NOLF105

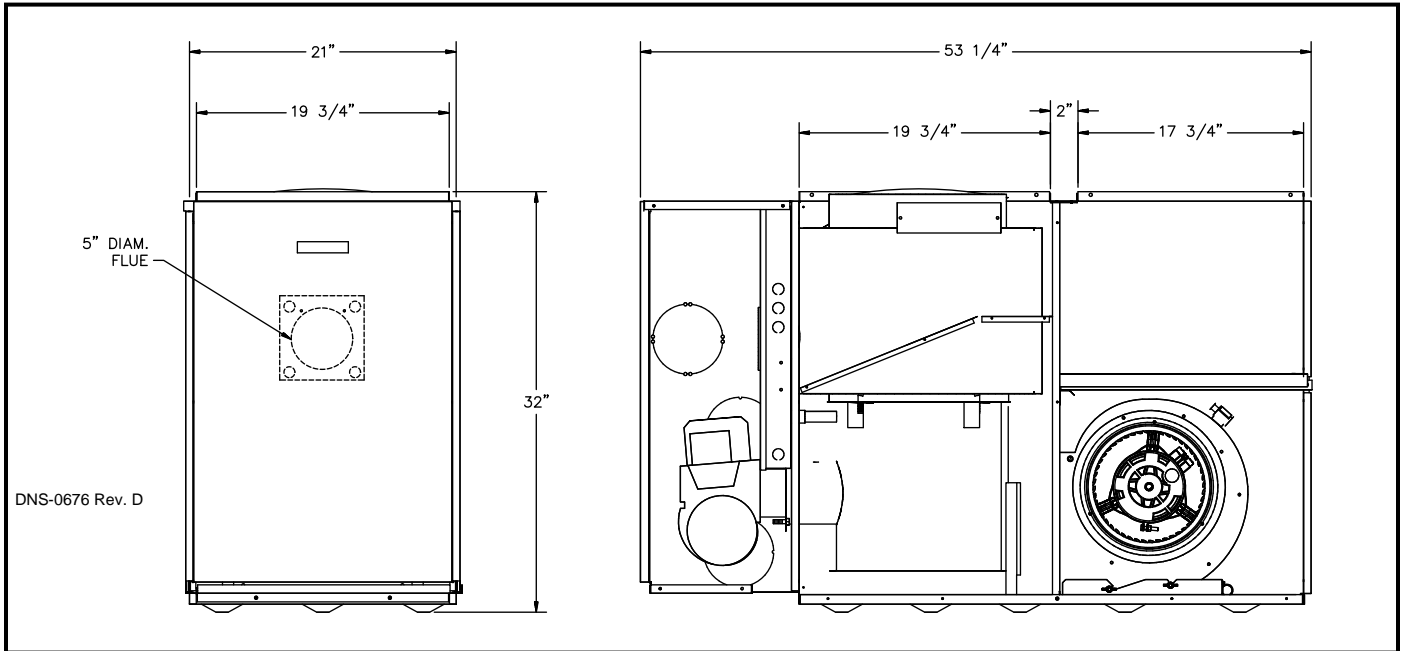


Figure 11 : Wiring diagram

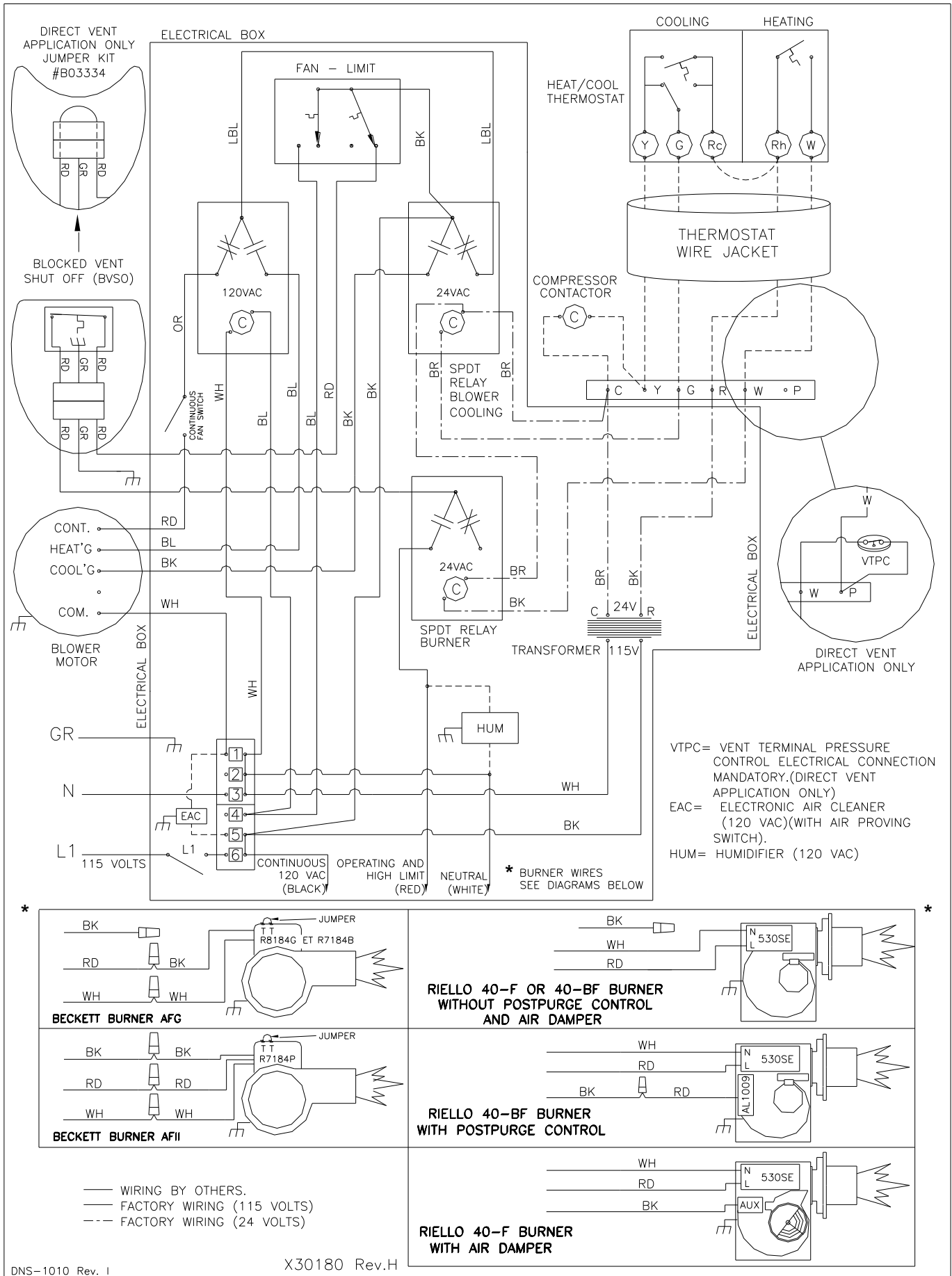
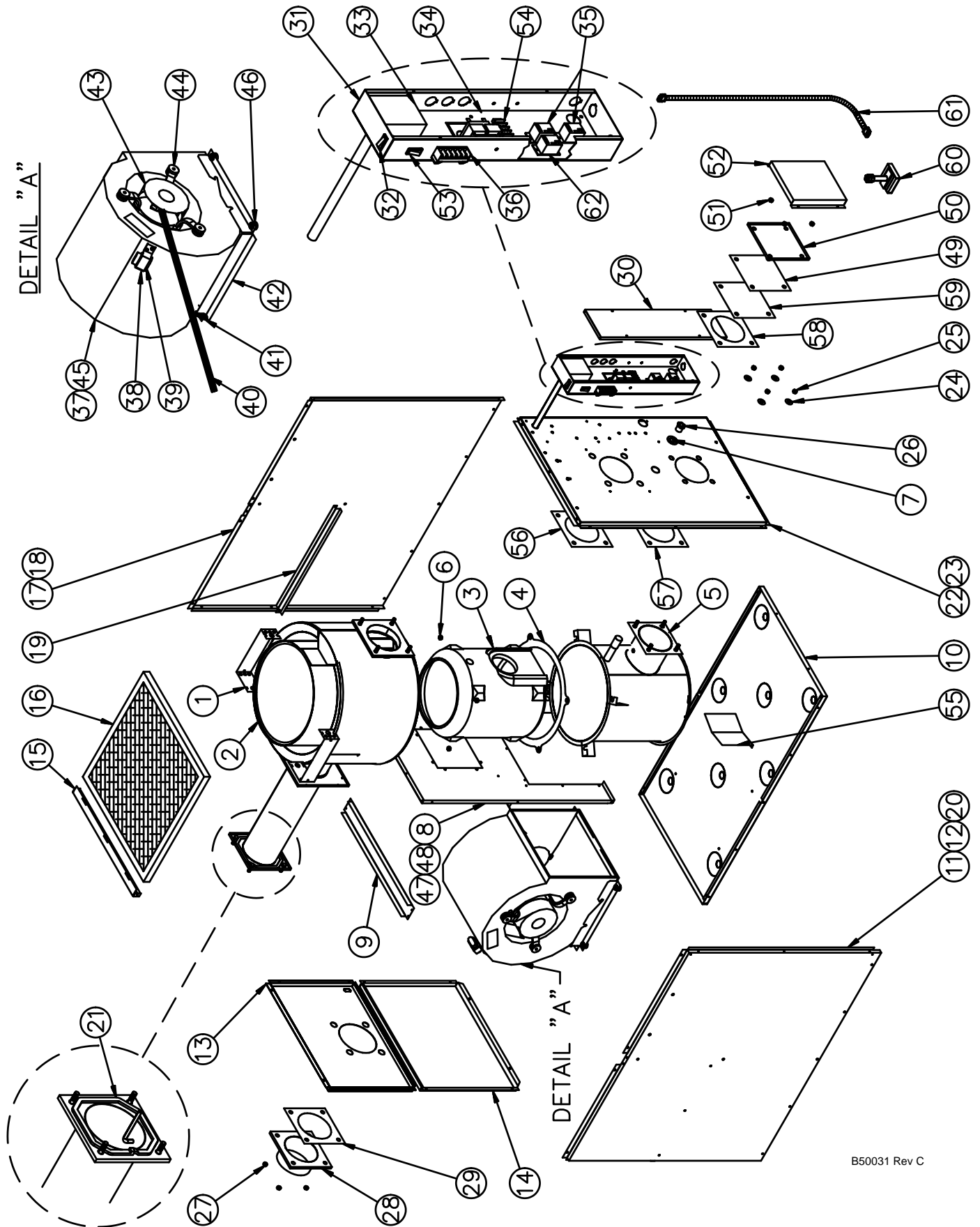


Figure 12 : Parts list OLB53R / OLR105

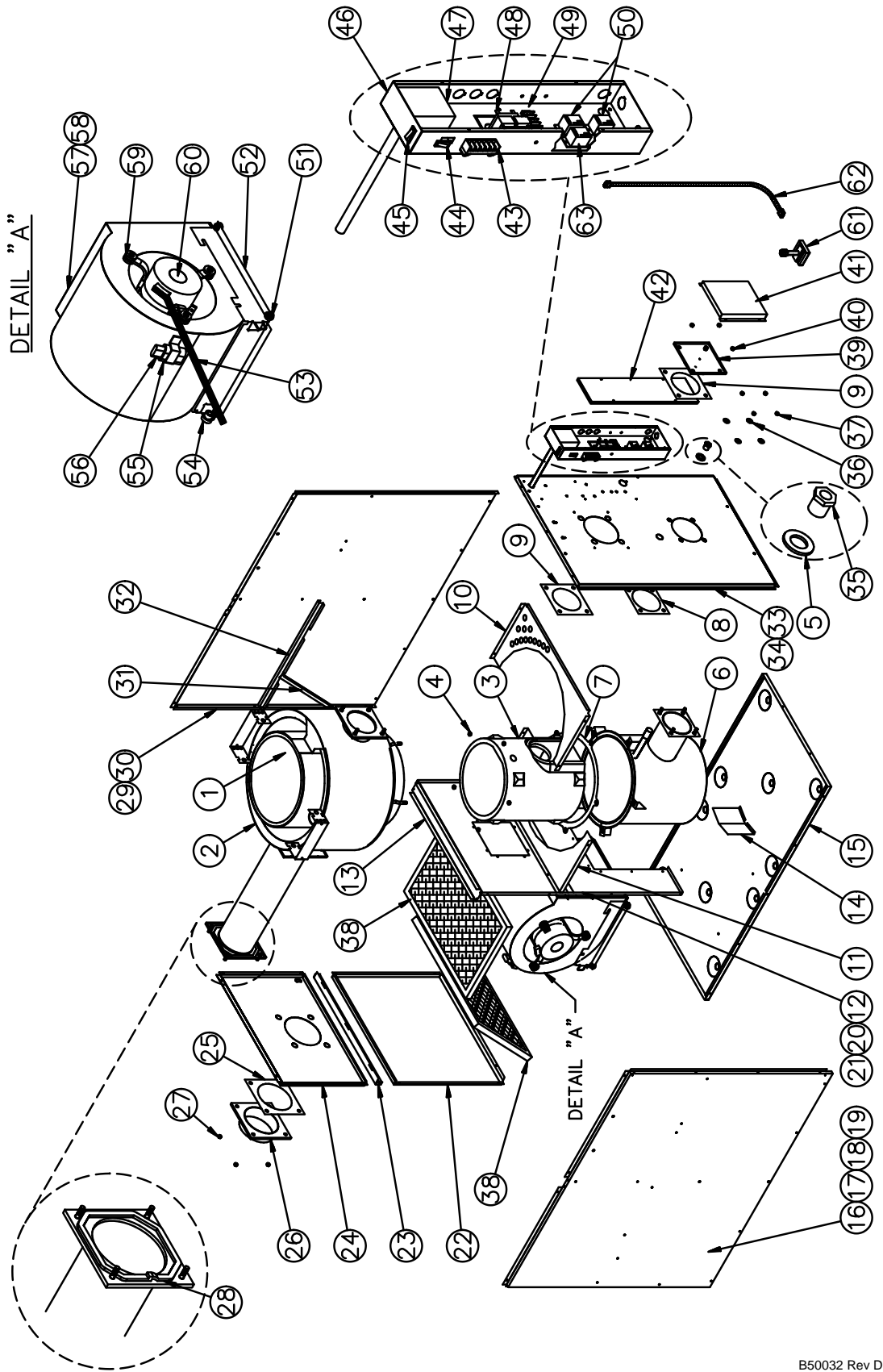


B50031 Rev C

Table 9 : Parts list OLB53R / OLR105

ITEM	PART#	DESCRIPTION
1	B30756-02	Complete heat exchanger
2	B30465-02	Top heat exchanger
3	B30518	Combustion chamber
4	B30517	Gasket, heat exchanger
5	B30757	Bottom heat exchanger
6	F07O001	Hexagonal flange nut 3/8-16NC brass
7	F06F015	Washer 1 7/16 zinc
8	B30488	Divider panel
9	B30478	Plenum divider
10	B30472	Floor
11	B30509-02	Left side panel assembly
12	B30493-04	Left side panel insulation
13	B30833-01	Top rear panel
14	B30512	Blower door assembly (labels included)
15	B30507	Air filter drawer
16	Z04F004	Paper filter 20 x 20 x 1
17	B30509-05	Right side panel assembly
18	B30493-03	Right side panel insulation
19	B30832-01	Right filter support
20	B30479-02	Left filter support
21	J06L002	Seal strip 1/4" x 1/8" x 25'
22	B30768-01	Front panel assembly (labels included, without logo)
23	B30762	Front panel insulation
24	F06F005	Washer 3/8" AA zinc
25	F07F024	Hexagonal nut 3/8-16NC brass
26	Z99F061	Sight glass
27	F07O001	Hexagonal flange nut 3/8-16NC brass
28A	B30459	5" breech plate (chimney application)
28B	B30515	3" breech plate (direct vent application)
29	B30415-02	Gasket, heat exchanger
30	B30808-01	Electrical box cover
31	B30828	Electrical box (box only)
32	L07F003	Rocker switch SPST (constant blower operation)
33	R02I008	Jumper Fan Limit 8"
34	L01F009	Transformer 120/24 VAC / 40 VA
35	L01H009	Relay SPDT 24VAC
36	L05F011	Terminal strip, 6 positions
37	B03720-04	Blower 100-10T (housing and wheel)
38	B01024	Capacitor holder
39	L01I001	Capacitor 5 MF
40	B30057	Blower electrical kit
41	F11F007	Cable tie
42	B30473	Blower support bracket
43	B01890-01	Motor assembly 1/3 HP (motor, bellyband and legs included)
44	B01888	Bellyband assembly (band, legs, nut & bolts included)
45	B01405-03	Blower assembly (items 37, 38, 39 & 43 included)
46	Z01F006	Rubber grommet
47	B01291-01	Seal strip 1 1/2" x 13 1/8"
48	B01025-99	Tab
49	B30415-01	Gasket, access cover
50	B30487	Flange plate
51	F07O001	Hexagonal flange nut 3/8-16NC brass
52	B30486	Access cover
53	L07F016	Rocker switch SPST (main power)
54	A00336	Terminal strip, 6 positions
55	B30481	Blower baffle
56	B30415-02	Gasket, access cover
57	B30534	Gasket, burner
58	B30415-02	Gasket, access cover
59	B30533	Gasket, sealing plate
60	Z06G001	Blocked vent shut off BVSO
61	B03118-01	External electrical kit
62	L01H011	Relay SPDT 120VAC

Figure 13 : Parts list OLB64R / OLR160

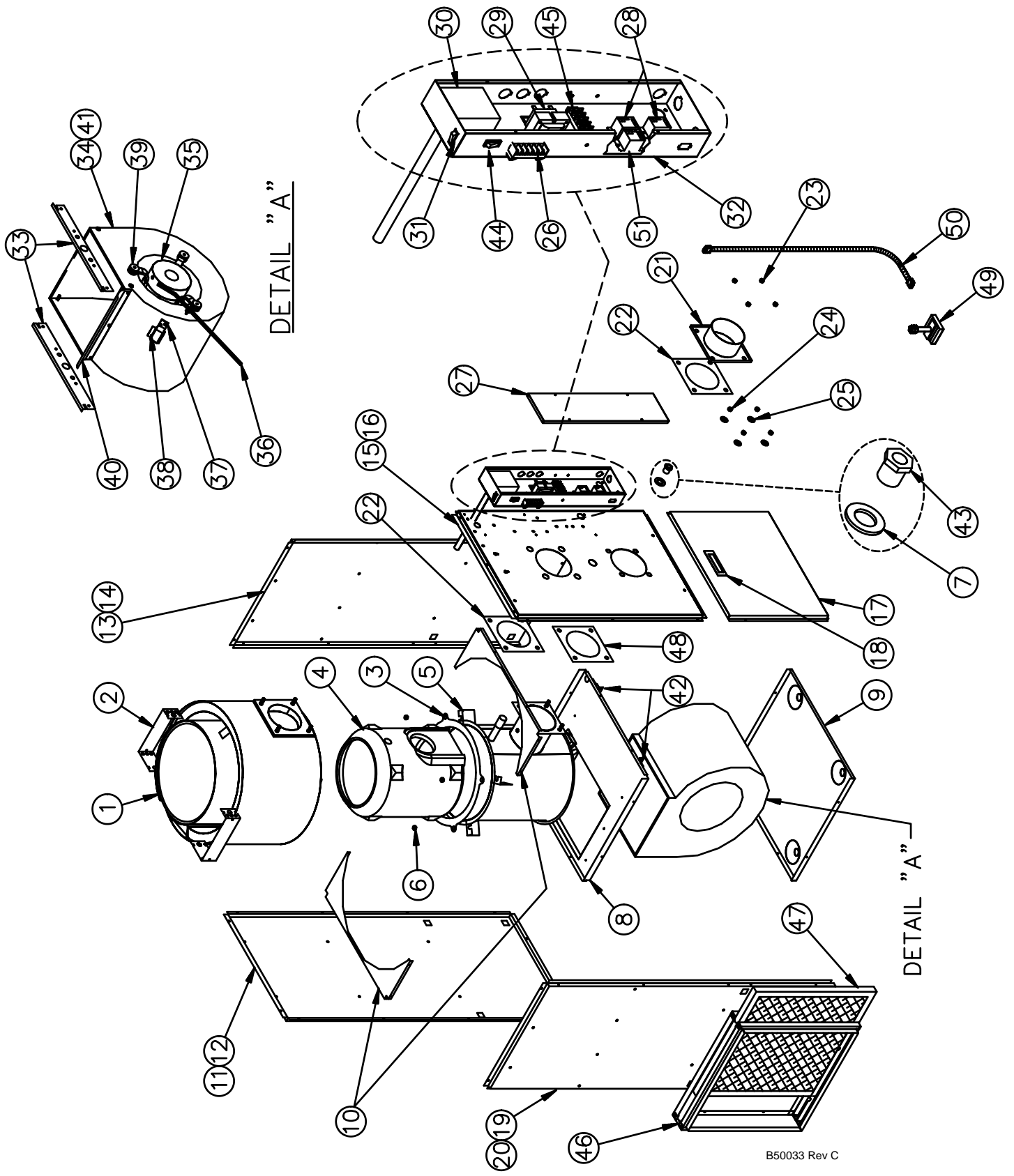


B50032 Rev D

Table 10 : Parts list OLB64R / OLR160

ITEM	PART #	DESCRIPTION
1	B30786-02	Complete heat exchanger (combustion chamber included)
2	B30596	Top heat exchanger
3	B30531	Combustion chamber (item 7 included)
4	F07O001	Hexagonal flange nut 3/8-16NC brass
5	F06F015	Washer 1 7/16 zinc
6	B30787	Bottom heat exchanger
7	B30532	Gasket, heat exchanger
8	B30534	Gasket, heat exchanger
9	B30415-02	Gasket, heat exchanger
10	B30665	Front baffle
11	B30664	Rear baffle
12	B30666	Divider panel
13	B30669	Plenum divider
14	B30481	Blower baffle
15	B30663	Floor
16	B30680-02	Left side panel assembly
17	B30686-02	Left side panel insulation
18	B30668-02	Left bottom filter support
19	B30667	Left top filter support
20	B10256-99	Tab
21	B01291-02	Gasket, seal strip
22	B30683	Blower door assembly (labels included)
23	B30678	Air filter drawer
24	B30836-01	Top rear panel
25	B30589-01	Gasket, breech plate
26A	B30646	6" breech plate (chimney application)
26B	B30647	4" breech plate (direct vent application)
27	F07O001	Hexagonal flange nut 3/8-16NC brass
28	J06L002	Seal strip 1/2" x 1/8" x 25'
29	B30680-05	Right side panel assembly
30	B30686-01	Right side panel insulation
31	B30668-01	Right bottom filter support
32	B30835	Right top filter support
33	B30782-01	Front panel assembly (labels included, without logo)
34	B30780	Front panel insulation
35	Z99F061	Sight glass
36	F06F005	Washer 3/8" AA zinc
37	F07F024	Hexagonal nut 3/8-16NC brass
38	Z04F007	Paper filter 16 x 24 x 1
39	B30676	Flange plate
40	F07O001	Hexagonal flange nut 3/8-16NC brass
41	B30486	Access cover
42	B30808-01	Electrical box cover
43	L05F011	Terminal strip, 6 positions
44	L07F016	Rocker switch SPST (main power)
45	L07F003	Rocker switch SPST (constant blower operation)
46	B30828	Electrical box (box only)
47	R02I008	Jumper Fan Limit 8"
48	L01F009	Transformer 120/24 VAC / 40 VA
49	A00336	Terminal strip, 6 positions
50	L01H009	Relay SPDT 24VAC
51	Z01F006	Rubber grommet.
52	B01756	Blower support bracket
53	B30530-01	Blower electrical kit
54	L04I010	Strain release bushing
55	B01024	Capacitor holder
56	L01I005	15 MF capacitor
57	B03720-05	Blower 120-10T (housing and wheel)
58	B01406-06	Blower assembly (items 55, 56, 57, 59 and 60 included)
59	B01889	Motor mount assembly (band, legs, nut & bolts included)
60	L06I004	3/4 HP direct drive motor (without legs)
61	Z06G001	Blocked vent shut off BVSO
62	B03118-01	External electrical kit BVSO
63	L01H011	Relay SPDT 120VAC

Figure 14 : Parts list OHB53F / OUF105

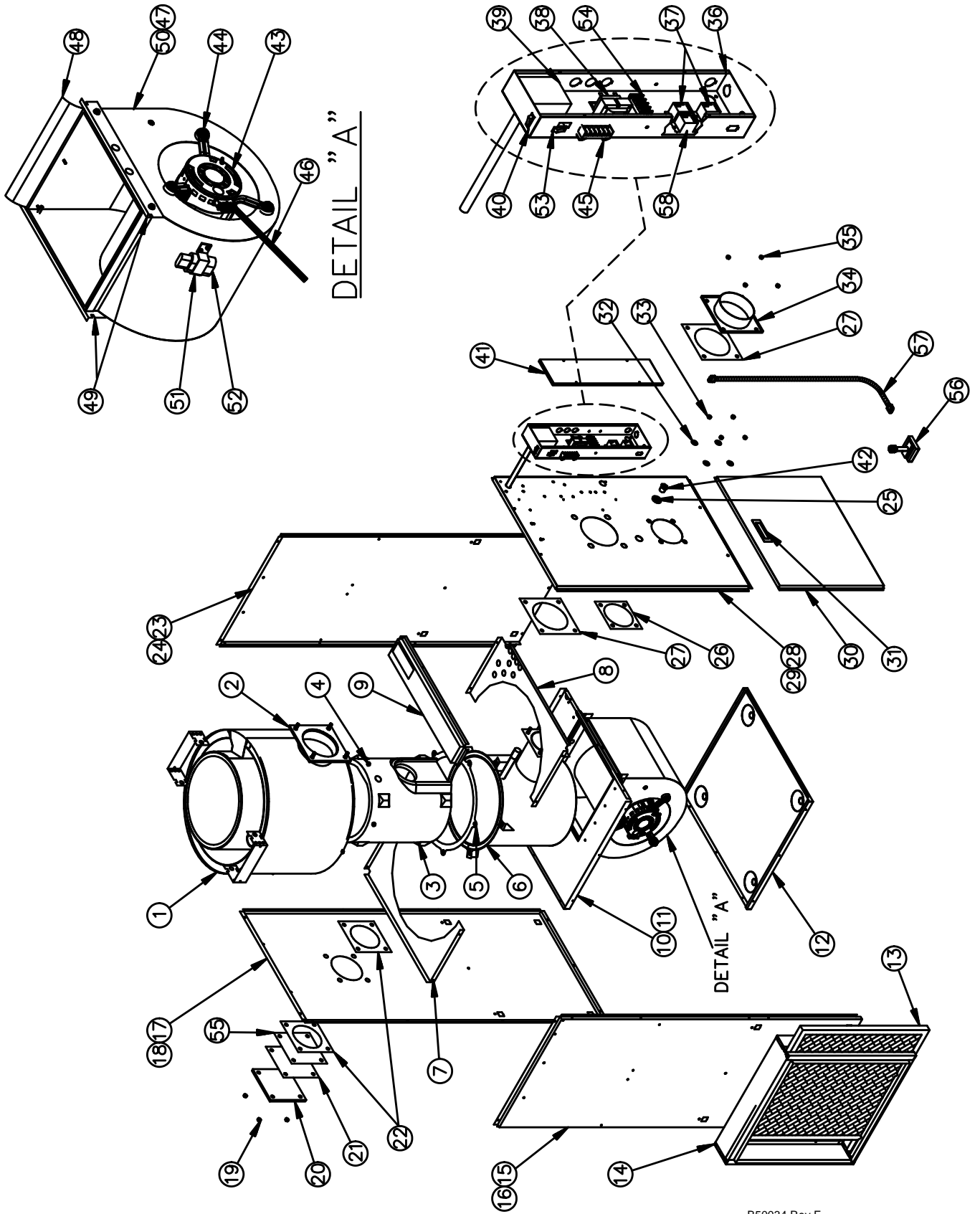


B50033 Rev C

Table 11 : Parts list OHB53F / OUF105

ITEM	PART #	DESCRIPTION
1	B30756-01	Complete heat exchanger (combustion chamber included)
2	B30465-01	Top heat exchanger
3	B30517	Gasket, heat exchanger
4	B30518	Combustion chamber (item 3 included)
5	B30757	Bottom heat exchanger
6	F07O001	Hexagonal flange nut 3/8-16NC brass
7	F06F015	Washer 1 7/16 zinc
8	B30431	Divider panel
9	B30430	Floor
10	B30426	Baffle
11	B30457	Rear panel assembly
12	B30419	Rear panel insulation
13	B30458-01	Right side panel assembly
14	B30418	Right side panel insulation
15	B30760-01	Front panel assembly (labels included, without logo)
16	B30761	Front panel insulation
17	B30455	Blower door assembly (labels included)
18	Z99F050	Door handle
19	B30458-02	Left side panel assembly
20	B30418	Left side panel insulation
21A	B30459	5" breech plate (chimney application)
21B	B30515	3" breech plate (direct vent application)
22	B30415-02	Gasket, heat exchanger
23	F07O001	Hexagonal flange nut 3/8-16NC brass
24	F07F024	Hexagonal nut 3/8-16NC brass
25	F06F005	Washer 3/8" AA zinc
26	L05F011	Terminal strip, 6 positions
27	B30808-01	Electrical box cover
28	L01H009	Relay SPDT 24VAC
29	L01F009	Transformer 120/24 VAC / 40 VA
30	R021008	Jumper Fan Limit 8"
31	L07F003	Rocker switch SPST (constant blower operation)
32	B30826	Electrical box (box only)
33	B30433	Blower side rails
34	B03720-04	Blower 100-10T (housing and wheel)
35	L06H004	1/2 HP direct drive motor (without legs)
36	B30096	Blower electrical kit
37	B01024	Capacitor holder
38	L01I002	7.5 MF capacitor
39	B01888	Motor mount assembly (band, legs, nut & bolts included)
40	B01291-01	Seal strip 1 1/2" x 13 1/8"
41	B01979-01	Blower assembly (items 34, 35, 37 38, 39 & 40 included)
42	B30513	Blower slide support
43	Z99F061	Sight glass
44	L07F016	Rocker switch SPST (main power)
45	A00336	Terminal strip, 6 positions
46	B30083	Filter rack assembly (supply as an option)
47	Z04F004	Paper filter 20 x 20 x 1 (depends on filter rack size)
48	B30534	Gasket, burner
49	Z06G001	Blocked vent shut off BVSO
50	B03118-01	External electrical kit BVSO
51	L01H011	Relay SPDT 120VAC

Figure 15 : Parts list OHB64F / OUF160



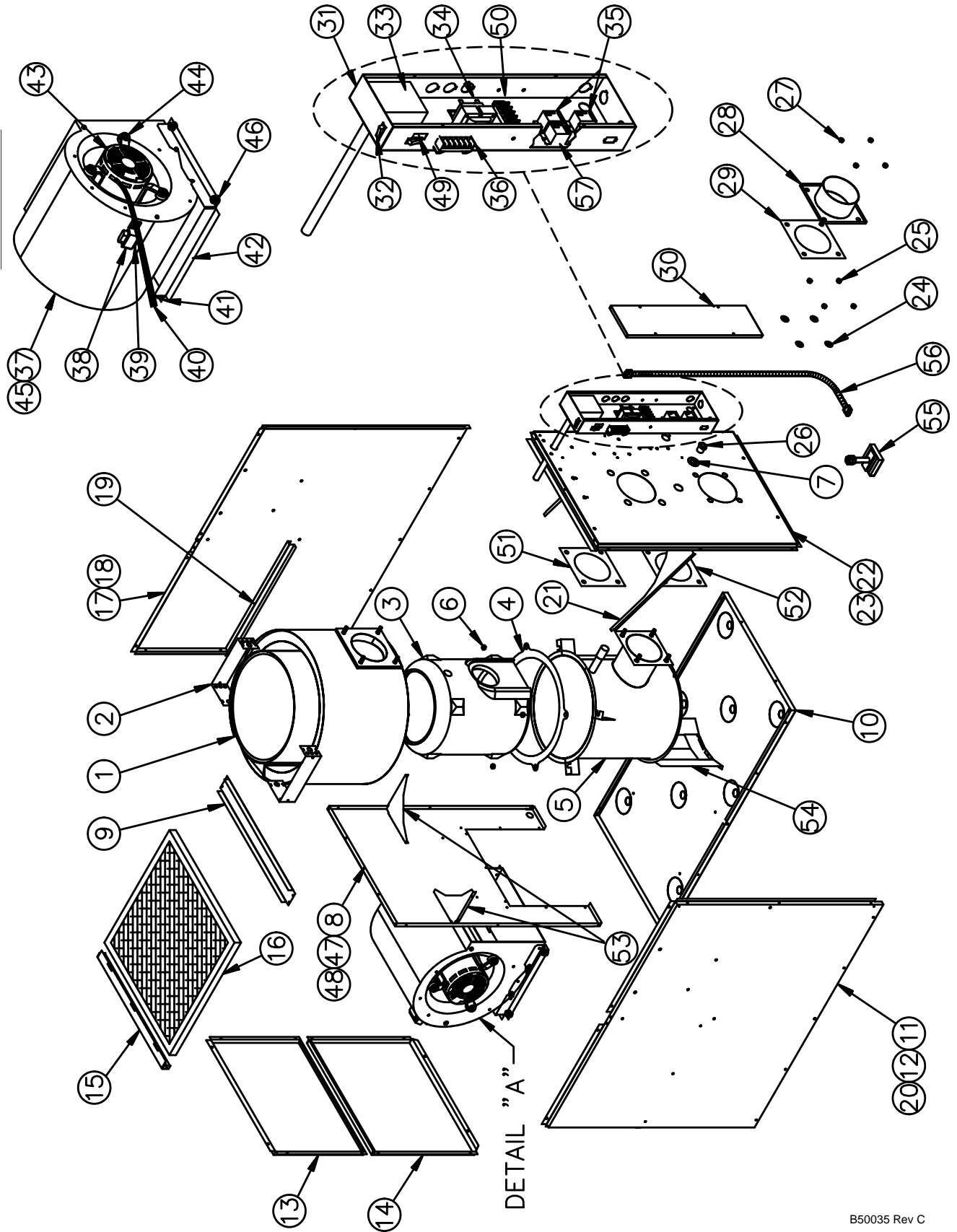
B50034 Rev E

Table 12 : Parts list OHB64F / OUF160

ITEM	PART #	DESCRIPTION
1	B30786-01	Complet heat exchanger (combustion chamber included)
2	B30597	Top heat exchanger
3	B30531	Combustion chamber (item 5 included)
4	F07O001	Hexagonal flange nut 3/8-16NC brass
5	B30532	Gasket, heat exchanger
6	B30787	Bottom heat exchanger
7	B30619	Rear baffle
8	B30618	Front baffle
9	B30639	Top baffle
10	B30627	Divider panel
11	B30625	Blower side support
12	B30628	Floor
13	Z04F011	Paper filter 24 x 24 x 1
14	B30656	Filter rack assembly (supplied as an option)
15	B30653-02	Left side panel assembly
16	B30658	Left side panel insulation
17	B30652	Rear panel assembly
18	B30659	Rear panel insulation
19	F07O001	Hexagonal flange nut 3/8-16NC brass
20	B30487	Breech plate
21	B30415-01	Gasket, access cover
22	B30415-02	Gasket, heat exchanger
23	B30653-01	Right side panel assembly
24	B30658	Right side panel insulation
25	F06F015	Washer 1 7/16 zinc
26	B30534	Gasket, burner
27	B30589-01	Gasket, breech plate
28	B30781-01	Front panel assembly (labels included)
29	B30779	Front panel insulation
30	B30651	Blower door assembly (labels included, without logo)
31	Z99F050	Door handle
32	F06F005	Washer 3/8" AA zinc
33	F07F024	Hexagonal nut 3/8-16NC brass
34A	B30646	6" breech plate (chimney application)
34B	B30647	4" breech plate (direct vent application)
35	F07O001	Hexagonal flange nut 3/8-16NC brass
36	B30826	Electrical box (box only)
37	L01H009	Relay SPDT 24VAC
38	L01F009	Transformer 120/24 VAC / 40 VA
39	R02I008	Jumper Fan Limit 8"
40	L07F003	Rocker switch SPST (constant blower operation)
41	B30808-01	Electrical box cover
42	Z99F061	Sight glass
43	L06K004	Motor 1 HP DD (without legs)
44	B01889	Motor mount assembly (band, legs, nut & bolts included)
45	L05F011	Terminal strip, 6 positions
46	B30530	Blower electrical kit
47	B03720-05	Blower 120-10T (housing and wheel)
48	B01291-01	Seal strip
49	B30626	Blower side rails
50	B02167-01	Blower assembly (items 43, 44, 47, 51 and 52 included)
51	B01024	Capacitor holder
52	L01I003	Capacitor 10 MF
53	L07F016	Rocker switch SPST (main power)
54	A00336	Terminal strip, 6 positions
55	B30533	Gasket, sealing plate
56	Z06G001	Blocked vent shut off BVSO
57	B03118-01	External Electrical kit for BVSO
58	L01H011	Relay SPDT 120VAC

B50034 Rev F

Figure 16 : Parts list OLB53F / OLF105



B50035 Rev C

Table 13 : Parts list OLB53F / OLF105

ITEM	PART #	DESCRIPTION
1	B30756-01	Complete heat exchanger (combustion chamber included)
2	B30465-01	Top heat exchanger
3	B30518	Combustion chamber (item 4 included)
4	B30517	Gasket, heat exchanger
5	B30757	Bottom heat exchanger
6	F07O001	Hexagonal flange nut 3/8-16NC brass
7	F06F015	Washer 1 7/16 zinc
8	B30477	Division panel
9	B30478	Plenum divider
10	B30472	Floor
11	B30504-02	Left side panel assembly
12	B30493-02	Left side panel insulation
13	B30506	Top rear panel
14	B30512	Blower door assembly (labels included)
15	B30507	Air filter drawer
16	Z04F004	Paper filter 20 x 20 x 1
17	B30504-01	Right side panel assembly
18	B30493-01	Right side panel insulation
19	B30479-01	Right filter support
20	B30479-02	Left filter support
21	B30483	Front baffle
22	B30767-01	Front panel assembly (labels included, without logo)
23	B30761	Front panel insulation
24	F06F005	Washer 3/8" AA zinc
25	F07F024	Hexagonal nut 3/8-16NC brass
26	Z99F061	Sight glass
27	F07O001	Hexagonal flange nut 3/8-16NC brass
28A	B30459	5" breech plate (chimney application)
28B	B30515	3" breech plate (direct vent application)
29	B30415-02	Gasket, heat exchanger
30	B30808-01	Electrical box cover
31	B30826	Electrical box (box only)
32	L07F003	Rocker switch SPST (constant blower operation)
33	R02I008	Jumper Fan limit 8"
34	L01F009	Transformer 120/24 VAC / 40 VA
35	L01H009	Relay SPDT 24VAC
36	L05F011	Terminal strip, 6 positions
37	B03720-04	Blower 100-10T (housing and wheel)
38	B01024	Capacitor holder
39	L01I001	Capacitor 5 MF
40	B30057	Blower electrical kit
41	F11F007	Cable tie
42	B30473	Blower support bracket
43	B01890-01	Motor assembly 1/3 HP (motor, bellyband and legs included)
44	B01888	Bellyband assembly (band, legs, nut & bolts included)
45	B01405-03	Blower assembly (items 37, 38, 39 & 43 included)
46	Z01F006	Rubber grommet
47	B01291-01	Seal strip 1 1/2" x 13 1/8"
48	B30188-02	Tab
49	L07F016	Rocker switch SPST (main power)
50	A00336	Terminal strip, 6 positions
51	B30415-02	Gasket, heat exchanger
52	B30534	Gasket, burner
53	B30490	Rear baffle
54	B30480	Front baffle
55	Z06G001	Blocked vent shut off BVSO
56	B03118-01	External electrical kit
57	L01H011	Relay SPDT 120VAC

Figure 17 : Parts list NOLB53F - NOLF105

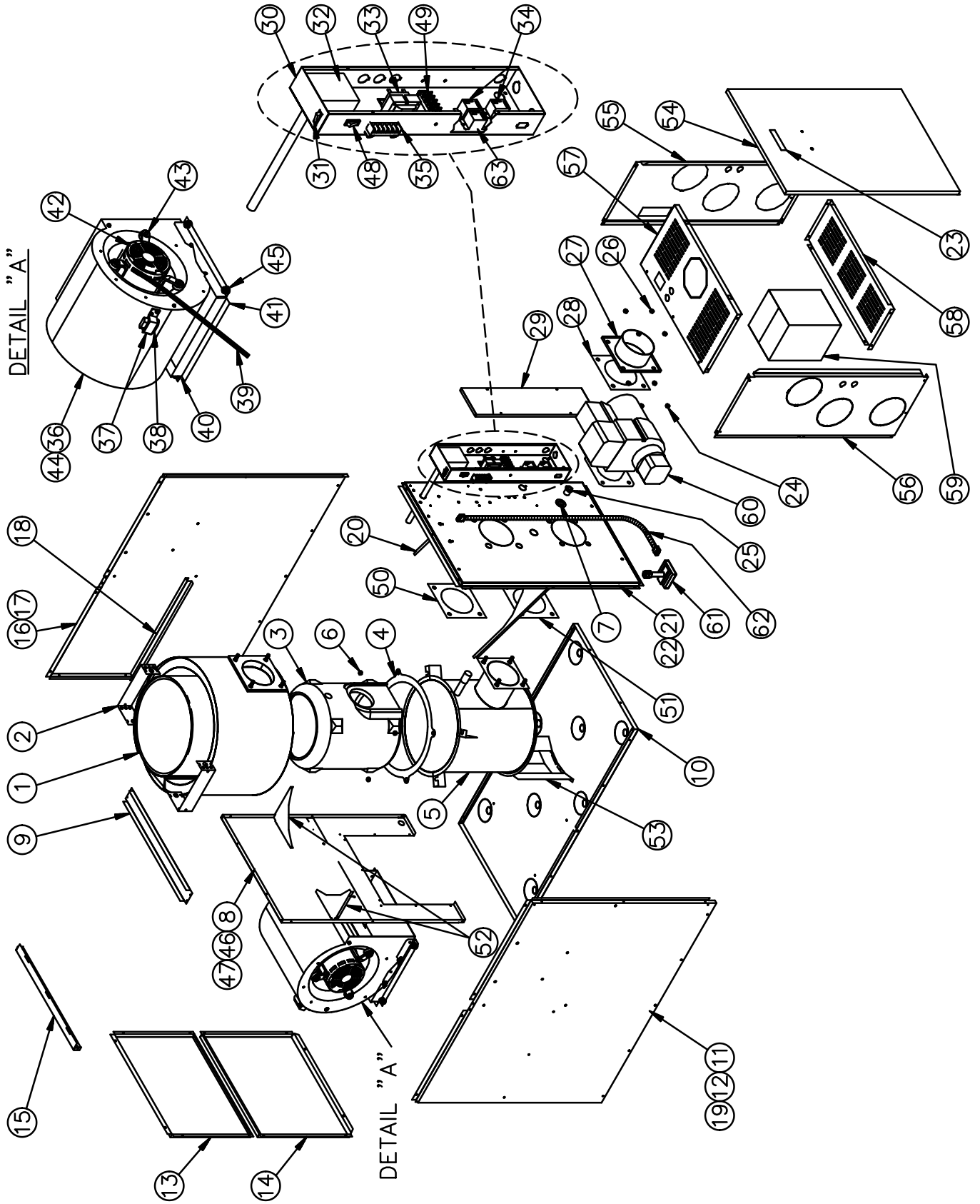
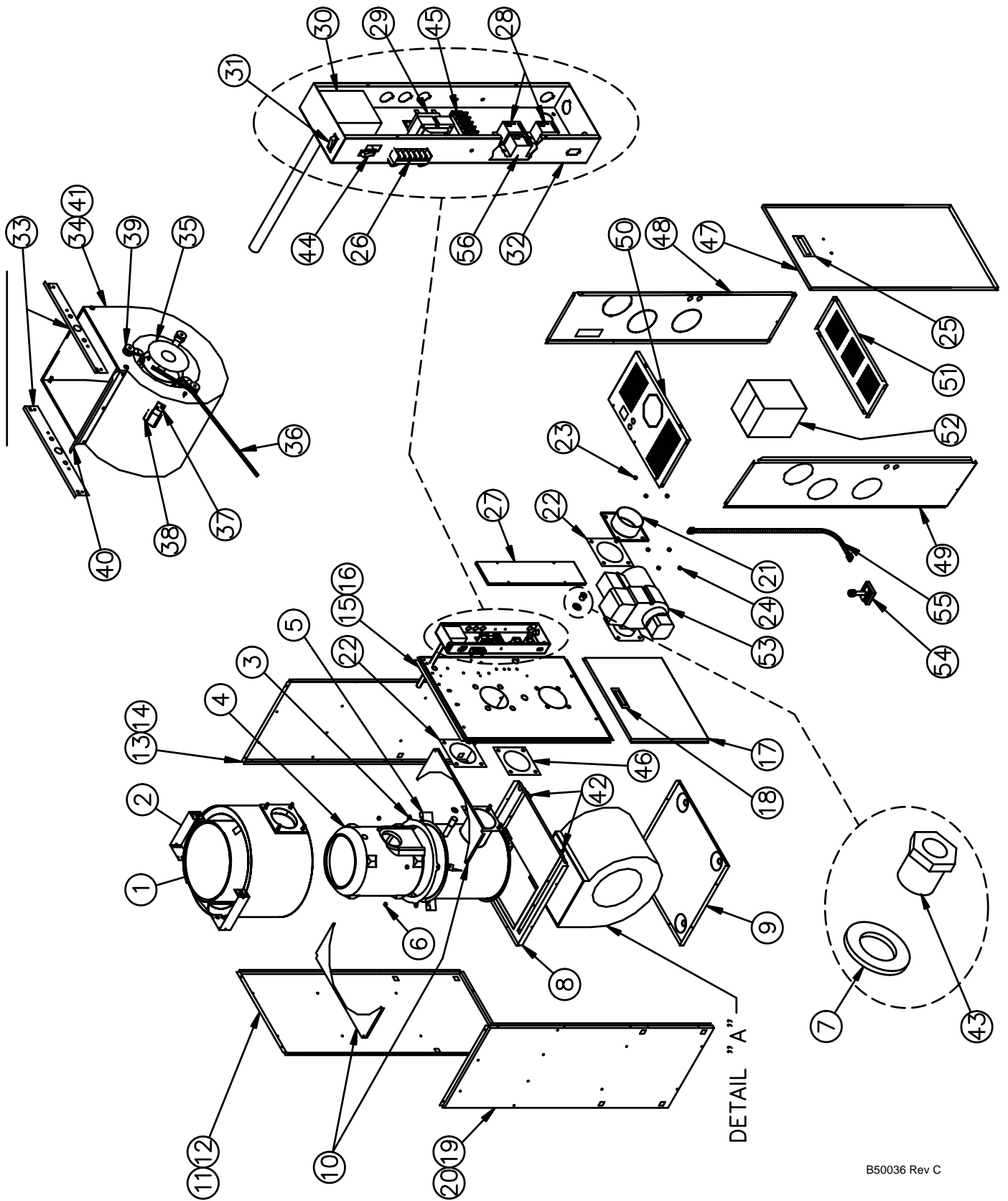


Table 14 : Parts list NOLB53F - NOLF105

ITEM	PART #	DESCRIPTION
1	B30756-01	Complete heat exchanger (combustion chamber included)
2	B30465-01	Top heat exchanger
3	B30518	Combustion chamber (item 4 included)
4	B30517	Gasket, heat exchanger
5	B30757	Bottom heat exchanger
6	F07O001	Hexagonal flange nut 3/8-16NC brass
7	F06F015	Washer 1 7/16 zinc
8	B30477	Divider panel
9	B30478	Plenum divider
10	B30472	Floor
11	B30504-02	Left side panel assembly
12	B30493-02	Left side panel insulation
13	B30475	Top rear panel
14	B30512	Blower door assembly (labels included)
15	B30507	Air filter drawer
16	B30504-01	Right side panel assembly
17	B30493-01	Right side panel insulation
18	B30479-01	Right filter support
19	B30479-02	Left filter support
20	B30483	Front baffle
21	B30767-01	Front panel assembly (labels included, without logo)
22	B30761	Front panel insulation
23	Z99F050	Door handle
24	F07F024	Hexagonal nut 3/8-16NC brass
25	Z99F061	Sight glass
26	F07O001	Hexagonal flange nut 3/8-16NC brass
27A	B30459	5" breech plate (chimney application)
27B	B30515	3" breech plate (direct vent application)
28	B30415-02	Gasket, heat exchanger
29	B30808-01	Electrical box cover
30	B30826	Electrical box (box only)
31	L07F003	Rocker switch SPST (constant blower operation)
32	R02I008	Jumper Fan Limit 8"
33	L01F009	Transformer 120/24 VAC / 40 VA
34	L01H009	Relay SPDT 24VAC
35	L05F011	Terminal strip, 6 positions
36	B03720-04	Blower 100-10T (housing and wheel)
37	B01024	Capacitor holder
38	L01I001	Capacitor 5 MF
39	B30057	Blower electrical kit
40	F11F007	Cable tie
41	B30473	Blower support bracket
42	B01890-01	Motor assembly 1/3 HP (motor, bellyband & legs included)
43	B01888	Motor mount assembly (band, legs, nut & bolts included)
44	B01405-03	Blower assembly (items 36, 37, 38 and 42 included)
45	Z01F006	Rubber grommet
46	B01297-01	Seal strip
47	B01025-99	Tab
48	L07F016	Rocker switch SPST (main power)
49	A00336	Terminal strip, 6 positions
50	B30415-02	Gasket, breech plate
51	B30534	Gasket, burner
52	B30490	Rear baffle
53	B30480	Front baffle
54	B40292	Front door, vestibule
55	B30729	Right panel, vestibule
56	B30730	Left panel, vestibule
57	B30723	Top panel, vestibule
58	B30724	Bottom panel, vestibule
59	Z06F001	Draft regulator
60	N01J040	Beckett burner AFG-F0
61	Z06G001	Blocked vent shut off BVSO
62	B03118-01	External electrical kit BVSO
63	L01H011	Relay SPDT 120VAC

Figure 18 : Parts list NOHB53F - NOUF105



B50036 Rev C

Table 15 : Parts list NOHB53F - NOUF105

ITEM	PART #	DESCRIPTION
1	B30756-01	Complete heat exchanger (combustion chamber included)
2	B30465-01	Top heat exchanger
3	B30517	Gasket, heat exchanger
4	B30518	Combustion chamber (item 3 included)
5	B30757	Bottom heat exchanger
6	F07O001	Hexagonal flange nut 3/8-16NC brass
7	F06F015	Washer 1 7/16 zinc
8	B30431	Divider panel
9	B30430	Floor
10	B30426	Baffle
11	B30457	Rear panel assembly
12	B30419	Rear panel insulation
13	B30458-01	Right side panel assembly
14	B30418	Right side panel insulation
15	B30760-01	Front panel assembly (labels included, without logo)
16	B30761	Front panel insulation
17	B30455	Blower door assembly (labels included)
18	Z99F050	Door handle
19	B30458-02	Left side panel assembly
20	B30418	Left side panel insulation
21A	B30459	5" breech plate (chimney application)
21B	B30515	3" breech plate (direct vent application)
22	B30415-02	Gasket, heat exchanger
23	F07O001	Hexagonal flange nut 3/8-16NC brass
24	F07F024	Hexagonal nut 3/8-16NC brass
25	Z99F050	Door handle
26	L05F011	Terminal strip, 6 positions
27	B30808-01	Electrical box cover
28	L01H009	Relay SPDT 24VAC
29	L01F009	Transformer 120/24 VAC / 40 VA
30	R02I008	Jumper Fan Limit 8"
31	L07F003	Rocker switch SPST
32	B30826	Electrical box (box only)
33	B30433	Blower side rails
34	B03720-04	Blower 100-10T (housing and wheel)
35	L06H004	1/2 HP direct drive motor (without legs)
36	B30096	Blower electrical kit
37	B01024	Capacitor holder
38	L01I002	Capacitor 7.5 MF
39	B01888	Motor mount assembly (Band, legs, nut & bolts included)
40	B01291-01	Seal strip 1 1/2" x 13 1/8"
41	B01405-03	Blower assembly (items 34, 35, 37, 38, 39 & 40 included)
42	B30513	Blower slide support
43	Z99F061	Sight glass
44	L07F016	Rocker switch SPST (main power)
45	A00336	Terminal strip, 6 positions
46	B30534	Gasket, burner
47	B40293	Front door, vestibule
48	B30725	Right panel, vestibule
49	B30726	Left panel, vestibule
50	B30723	Top panel, vestibule
51	B30724	Bottom panel, vestibule
52	Z06F001	Draft regulator
53	N01J040	Beckett burner AFG-F0
54	Z06G001	Blocked vent shut off BVSO
55	B03118-01	External electrical kit BVSO
56	L01H011	Relay SPDT 120VAC

B50036 Rev F