



SUPPLEMENTARY / CENTRAL WOODBURNING FURNACE MODEL 621

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INSTALLATION AND OPERATION INSTRUCTION MANUAL

NOTE: This model has been tested and listed in accordance with Underwriters Laboratories standard UL 391-2010 for Solid Fuel Central and Supplementary Furnaces by Warnock Hersey International, Inc. ICBO Report No. TL116; NER Qa219.

PRINCIPLE OF OPERATION:

This furnace model is designed for conventional up flow residential central forced air heating systems, to be installed in either of the following ways:

1. Supplementary "Add-On" Furnace Application (See FIG. 1)

As a supplementary furnace, this model is connected in parallel to a conventional primary furnace system, using present ductwork to distribute wood-heated air throughout the home. As long as the heat produced by the supplementary furnace keeps the living area temperature above the setting on the primary furnace wall thermostat, the primary furnace should not burn any gas, oil or use any electricity beyond that required to run the primary distribution blower. Should the wood fire fail to provide sufficient heat, however, the primary furnace will begin operating as usual.

2. Central Furnace Application (See FIG. 2)

This furnace also may be used as a freestanding central furnace, with its own plenums and ductwork. The 550-cfm blower provided with this furnace is often sufficient to provide air distribution for average size homes with relatively normal size duct runs. NOTE: A second single No. 273 550-cfm blower can be added to the back of the DAKA 621 to increase airflow or a No. 218 1580-cfm side mounted blower may be required for larger homes with longer ductwork. Call 1-800-884-3252 to order. As wood burning requires periodic attention, use of this unit as a central furnace is somewhat inconvenient and requires a second heating system (electric baseboard, vented gas room heaters, etc.) to act as a backup.

CAUTIONARY NOTES:

1. This furnace is designed for use only in conventional up flow systems and must deliver heated air to a supply (warm air) plenum – never to ductwork. The warm air supply from this furnace must never be connected to the cold-air return inlet of a central primary furnace, as a possibility exists of components of the central furnace overheating and causing the central furnace to operate other than as intended.
2. Installation of this unit must be performed by a qualified installer familiar with solid-fuel systems.
3. **This furnace must be connected to a minimum 6" listed Type HT (high temperature) appliance type chimney or a code-complying tile-lined masonry chimney. Connection to a chimney flue serving another appliance is prohibited.**
4. A barometric regulator/damper may be used in the chimney connector (smoke pipe leading to chimney flue) and must be set to maintain no more than .06" water column updraft (DAKA barometric regulator #283 with adjustable settings available at extra cost.)
5. Installation of this furnace in mobile homes or garages is prohibited.
6. This furnace must be installed on a non-combustible floor surface such as concrete or 3/8" asbestos millboard. This surface must extend at least 16" in front and 8" to side of DAKA furnace, under the chimney connector and at least 2" to each side of connector. Clearances to combustible surfaces are:

To side wall:	18"	Flue to back wall:	23"
To back wall:	32½"	Flue to side wall:	27"
To front wall:	48"		
7. Check local building and mechanical codes prior to installation to insure conformance with all requirements. Review home insurance policy for coverage.
8. Chimney connector must be of minimum 24-ga. pipe with each section joined with three sheet metal screws, with all fissures sealed with furnace cement. Do not use galvanized pipe as the coating could melt and cause toxic fumes.

9. This furnace has been designed to operate with a maximum warm air duct pressure of 0.2" water column and a maximum warm air duct temperature of 200°F. When used in a supplementary "add-on" mode, check the nameplate on the primary furnace to determine compatibility.
10. When any supplementary furnace is connected in parallel to an existing primary central furnace, a back-draft damper must be installed in the plenum of the primary furnace below the warm air inlet from the supplementary furnace to prevent the primary furnace from operating in an unintended manner. See FIG. 1 for an illustration of the position of this damper.

DANGER – RISK OF FIRE OR EXPLOSION! DO NOT BURN GARBAGE, GASOLINE, DRAIN OIL OR OTHER FLAMMABLE LIQUIDS.

WARNING – RISK OF FIRE! DO NOT OPERATE WITH FLUE DRAFT EXCEEDING .06" WATER COLUMN. DO NOT OPERATE WITH FUEL LOADING OR ASH REMOVAL DOORS OPEN. DO NOT STORE FUEL OR OTHER COMBUSTIBLE MATERIAL WITHIN MARKED INSTALLATION CLEARANCES. INSPECT AND CLEAN FLUES AND CHIMNEY REGULARLY.

CAUTION – HOT SURFACES! KEEP CHILDREN AWAY. DO NOT TOUCH DURING OPERATION. MAXIMUM DRAFT MARKED ON NAMEPLATE.

Disposal of Ashes

Ashes should be placed in a metal container with a tight-fitting lid. The closed container of ashes should be placed on a non-combustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in the soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled.

Creosote – Formation and Need for Removal

When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes an extremely hot fire.

The chimney connector and chimney should be inspected at least twice monthly during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated it should be removed to reduce the risk of a chimney fire. Use of a smoke vent thermometer to monitor stack temperature is recommended.

INSTALLATION INSTRUCTIONS:

I. UNPACKING

Remove all component parts from firebox for assembly; check piece count against parts list on page 14 of this manual. **NOTE: Remove firebrick from carton while still within firebox. Do NOT attempt to lift full carton.)**

Parts shortage: If carton was sealed when purchased, call or write factory immediately. Provide model number and serial number of furnace, found on front mounted data plate, along with a description and quantity of missing parts. Replacements will be shipped. If carton was purchased unsealed, contact store for missing parts.

Concealed Damage: If any components have been damaged in transit, advise the dealer from whom the furnace was purchased of the nature of the problem, so that a freight claim can be filed.

II. FURNACE ASSEMBLY (Refer to Parts List on page 14)

- A. Attach fire door (1) to hinge bracket using hinge pin. **IMPORTANT:** Refer to Instructions in Hinge Assembly Bolt Bag for proper installation. Note that door features a double latch operation to limit initial swing of door to 1" on opening. Continue turning handle clockwise beyond 3 o'clock position to permit full opening of door. Close door with handle in same position; rotate counterclockwise to lock.
- B. Insert thermal gasket (6) between ash door (5) and ash pan (7) front, and assemble using two 1/4" bolts and nuts provided.
- C. Insert Smoke Bypass Damper rod (8) through small hole above fire door, handle pointing up, and run rod directly back onto smoke baffle plate inside firebox. Reaching in through fire door opening, screw one large nut onto threaded rod all the way to the end of the thread. Insert threaded rod end into the hole on the upright plate on the Smoke Bypass Damper sliding plate, keeping the spring handle upright. Screw on the 2nd large nut and tighten fully.
- D. Remove cast-iron grate (10) from firebox. Proceed to install firebricks (15) along sides and back of firebox, starting at the front, by slipping brick under retaining angle iron and standing them upright on the grate support rails.

CAUTION: FIREBRICK MUST BE INSTALLED CORRECTLY OR HEAT DAMAGE MAY OCCUR.

- E. Reinstall cast-iron grate in firebox, reinforcing ribs down, resting on side rails. Insert 3" x 13½" x ¼" steel grate spacer (11) at rear of grate.
- F. Install 550-cfm blower (14) on back of furnace using four No. 12 x ½" screws provided.
- G. Furnace is shipped with air jacket already fitted and installed. If it has worked loose during shipping or unpacking, do the following:

1. Remove air jacket top (15) by lifting up from front to back only, not side to side.
2. Ensure that bottom air jacket panel (16) is fully seated between lower bottom support angles.
3. Ensure that channels welded on air jacket sides (17) engage the lower support channels, and that the side panels are pressed tightly onto furnace around the front and back corners.
4. Reinstall the air jacket top from back to front, making sure that all top edges of each of the air jacket sides are inside of top.
5. Install Swing Plate (19) on hooks inside combustion chamber above Fire door opening, with bent edge inward.

IV. WIRING INSTRUCTIONS – See FIG. 6 for Wiring Schematic

NOTE: For power supply connections, use No. 14 AWG or larger wires acceptable for at least 105°C. Shut Off All Power While Installing.

- A. Attach approved conduit carrying 3-wire 120V AC 15 amp service to any unused knockout hole on J-box ring with conduit connector (not included for field wiring connections).
- B. Make all wiring connections per the schematic in FIG. 6, making all connections shown with wire nuts provided. Check all wiring connections for tightness and electrical safety.
- C. Tuck all wires into J-Box Ring, install J-Box cover. Reinstall cover plate on blower junction box.

V. CONNECTIONS TO DUCTWORK

A. For Use As A Supplementary "Add-on" Furnace – See FIG. 1

NOTE: SUPPLY PLENUM MUST BE METAL! A back draft damper must be installed in the warm-air supply plenum of the primary furnace below the point where the warm air ductwork connection from the DAKA furnace enters the plenum. Actual design and installation procedure for such a back draft damper is left to the installer, due to the large number of plenum configurations involved. See FIG. 1 & FIG. 5 for illustration of placement.

1. Mark and cut out two 8" round holes in the side of the supply (warm air) plenum of the primary furnace.

IMPORTANT: Verify beforehand that sufficient clearance is available above air conditioner coils, etc. If sufficient clearance is not available, air conditioner coil may have to be moved to a second plenum with diversion baffles for summer use.

2. Attach each 90° sheet metal elbow to one end of straight 8" pipe. Insert elbow into supply plenum of primary furnace with outlet pointing upward. Slip collar over straight end of 8" pipe and push up tight against supply plenum for a good air seal. See FIG. 1 & FIG. 5.

IMPORTANT: The 90° elbows within the supply plenum forms a venturi to extract air from DAKA furnace when primary furnace blower comes on. An absence of these elbows will cause backpressure down the warm air pipe to the DAKA furnace, adversely affecting heat distribution, and possibly damaging the DAKA furnace. If space prohibits installation of 90° elbow as recommended, see FIG. 5 for alternate designs.

3. Connect cold air return of primary furnace to DAKA filter box using a minimum 10" diameter pipe.

NOTE: After attaching warm and cold air supply and return pipes to primary furnace, check entire system to insure that static pressure remains unaffected. Verify horizontal duct clearances (see FIG. 3).

B. For Use As A Central Furnace – See FIG. 2

1. Install a minimum 16" x 16" plenum (PLENUM MUST BE METAL) on air jacket top with tin snips or sabre saw as needed, using starting collar to attach.
2. Install ductwork with proper clearances to combustibles in accordance with local building codes.
3. Make sure to connect a cold air return line to the blower that was supplied with your new DAKA Model 621.

VI. CONNECTING DAKA FURNACE TO CHIMNEY

Mount and secure 6" non-galvanized smoke pipe, 24-ga. or heavier, to rear smoke outlet on DAKA furnace. Continue same gauge single-wall pipe to chimney connection, with following safety rules in mind:

1. A barometric regulator should be installed in smoke pipe at least 18" from furnace, to permit adjustment of chimney draft to a maximum of .06" water column draft. Barometric Regulator No. 283 with adjustable draft setting is available through DAKA for this purpose.
2. **Smoke pipe should maintain a minimum 18" clearance to all combustibles and should never pass through walls or ceilings. Use proper thimbles for those passages.**
3. Heat reclaimers, fins or the like should not be used on smoke pipe, as they tend to cool flue gases and add to creosote formation on stoves and furnaces of advanced airtight design.
4. All joints of chimney connector pipe should be secured with a minimum of three No. 7 sheet metal screws & further sealed with furnace cement to maintain good draft.

5. Smoke pipe should normally be installed with male ends leading from chimney to furnace; should runny creosote be formed in chimney connector, it will then return through pipe to furnace without dripping out of joints.
6. Maintain a minimum of 1/4" per foot of pipe rise to chimney connection; the steeper the rise, the more easily draft will be maintained, generally.
7. **Avoid the use of 90° elbows in any chimney connector, as they adversely affect draft. If 90° elbows must be used, do not install more than two in any chimney connector.**
8. Adequate combustion air must be provided in furnace area to prevent poor firing and smoking. Keep a window cracked open in furnace area or install dryer-type 4" vent to bring in fresh air.

VII. OPERATING CONTROLS

IMPORTANT: In a supplementary "Add-On" installation, the blower on the DAKA furnace can be used as a circulation blower for heating the house.

The blower can be used in conjunction with your primary furnace blower to boost air circulation in large ductwork systems. An optional fan control may need to be located in supply plenum to turn primary blower on and off when heat is received from the DAKA furnace. See FIG. 1 for fan control location.

IMPORTANT: Normal operation will produce flue gas temperatures in the 300°- 600°F range. If higher or lower operating temperatures are normally obtained, increase or decrease the barometric draft control setting and room thermostat setting to bring temperatures to within range. Too cool a flue gas temperature can result in heavy creosote formation, while too hot a temperature increases danger of chimney fire.

A. Smoke Bypass Damper

Due to the extra long smoke baffle in this model, designed to create the longest possible flame path for maximum heat extraction, a sliding smoke bypass damper plate, controlled by the damper rod over the fire door has been provided. Before opening fire door for reloading or checking fire, pull the damper rod out fully to allow the smoke to exit at rear of chamber, rather than rolling forward and possibly spilling into the room. After closing fire door, push damper rod fully in to seal rear vent.

VIII. EMERGENCY OPERATION INSTRUCTIONS

A. Operation During Power Failure

1. Remove furnace filter(s) to prevent fire hazard.
2. Set automatic draft control to no higher than "EPF" (Electrical Power Failure).
3. Continue firing the fire with smaller loads, more frequently tended.
4. Use extreme care and vigilance during power failure to keep furnace from

- overheating, which could cause severe warpage or breakage.
5. The air jacket top and side may be removed to provide more radiant heat to help cool the firebox.

CAUTION: DO NOT expect the DAKA furnace to keep the house as warm during a power failure as when power is on. Do no attempt to increase heat output by opening ash door or fire door.

B. In Case of a Chimney Fire:

1. Call the fire department immediately.
2. Reduce room thermostat to lowest point to shut off auto damper. Use chimney fire extinguishing flares if you have them. (Available at your local home store or fireplace and woodstove shops).
3. After chimney fire, do not attempt to use chimney again until a professional inspection is made to determine safety.

IX. MAINTENANCE OF YOUR DAKA FURNACE

A. Fueling Procedure

Fill with cordwood (and/or coal, if applicable) to the top of the firebrick. Before burning coal, you must have a coal burning grate and a fire door equipped with a spin draft (available from dealer or direct from the factory).

B. Flue Pipe and Chimney

These must be checked frequently during heating season, and deposits of soot and creosote over 1/8" thick removed using stiff-wired brushes designed for the job. Professional cleaning by a chimney sweep at least once a season is highly recommended.

C. DAKA Furnace Blower

The rear blower on your new DAKA Furnace Model 621 has permanently lubricated bearings. Re-lubrication is NOT required. Vacuum away dust and dirt on motor air inlets and also on blower impellers at least once each season.

CAUTION: TURN OFF ALL POWER TO UNIT BEFORE CLEANING AND LUBRICATION.

D. Fire Chamber and Ash Pan

Check ash pan every few days and safely dispose of ashes. Keep ashes from building up on grate and interfering with combustion airflow from below. At end of heating season, clean out all residual ashes from furnace. The moisture they contain could rust your furnace over the summer months, thereby shortening the life of the unit.

X. TROUBLE SHOOTING

A. Problem: Smoke puff back when loading, poor burning, insufficient heat **Solutions:**

1. Insufficient draft--debris or creosote could be blocking flue; inadequate chimney height or design could be causing downdrafts; check chimney connector for air leaks and seal with furnace cement; adjust barometric regulator to higher setting.
2. Insufficient make-up air-- the house could be so well insulated that infiltration air is not getting in to replace air used in combustion; open a window slightly in furnace room or install a vent to the outside in furnace area.

B. Problem: Poor heat throughout house while burning wood **Solutions:**

1. Poor quality wood--burn only wood which has been air-dried for at least six months, preferably a year or more. Use hardwoods such as hickory, oak, maple, etc. for highest heat value per load.
2. Check to insure that all cold air return vents are open and not blocked with furniture, etc.
3. Make sure that all duct joints are airtight, and apply duct tape to seal.
4. Check flue gas temperature--normal operating range is 300^o-600^oF. Lower temperature would indicate insufficient draft or inadequate combustion air.
5. Insure that primary furnace blower is turning on to distribute heat effectively. Lower "FAN ON" setting on primary furnace fan control to start circulation earlier.

C. Problem: Paint Discoloration (whitish appearance)

Solution:

Paint is rated for 900°F surfaces, and overheating of furnace will cause a whitish appearance on outside of combustion chamber surfaces; reduce chimney draft to control overheating. **NOTE:** To cover discoloration, obtain a high-temperature flat black spray paint from hardware or fireplace shop.

If problems persist, or help is needed in installation or operating of furnace, contact:

**Customer Service Department
DAKA Corporation
955 Industrial St. N.E.
Pine City, MN 55063
(320) 629-6737**

FIG. 1 – Typical Installation As Supplementary “Add-On” Furnace

NOTE: Supply plenum must be metal.

EXAMPLE

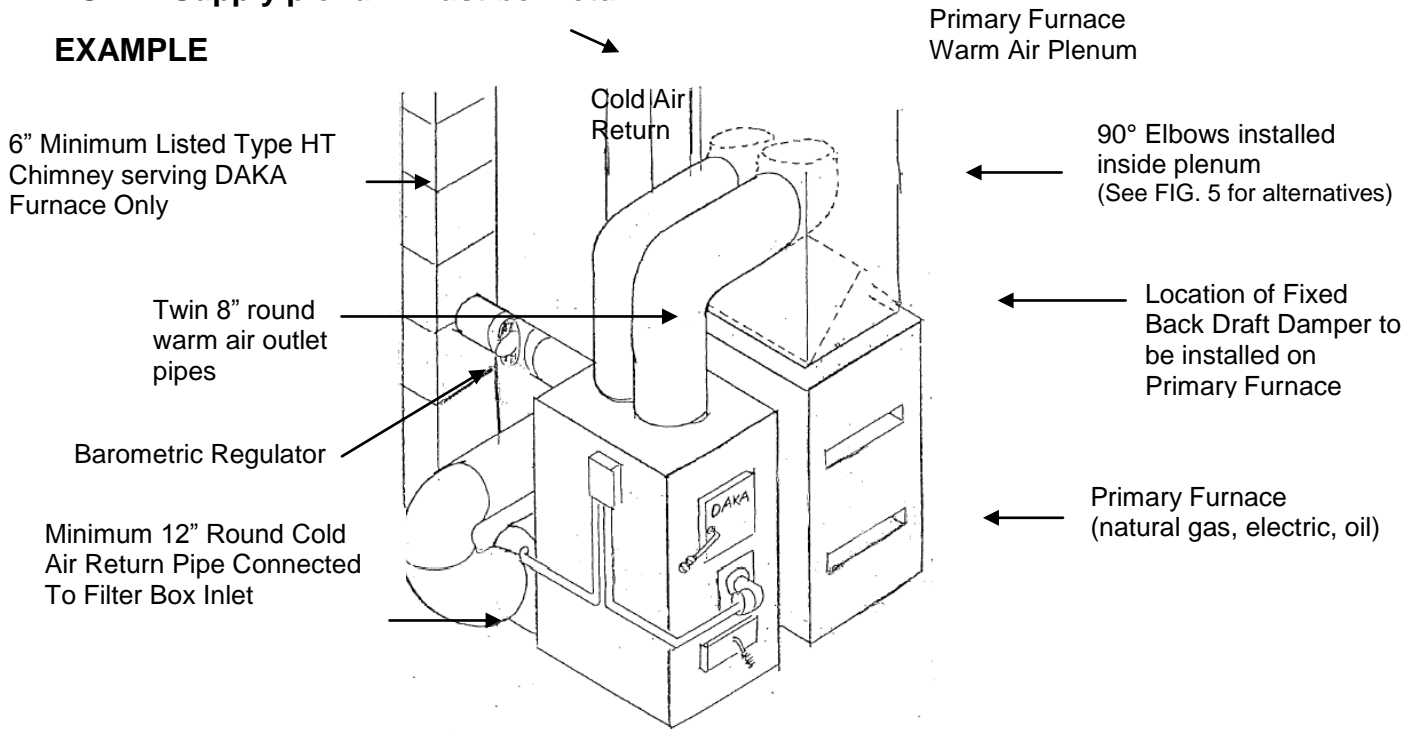


FIG. 2 – Typical Independent Central Furnace Installation

NOTE: Supply plenum must be metal.

EXAMPLE

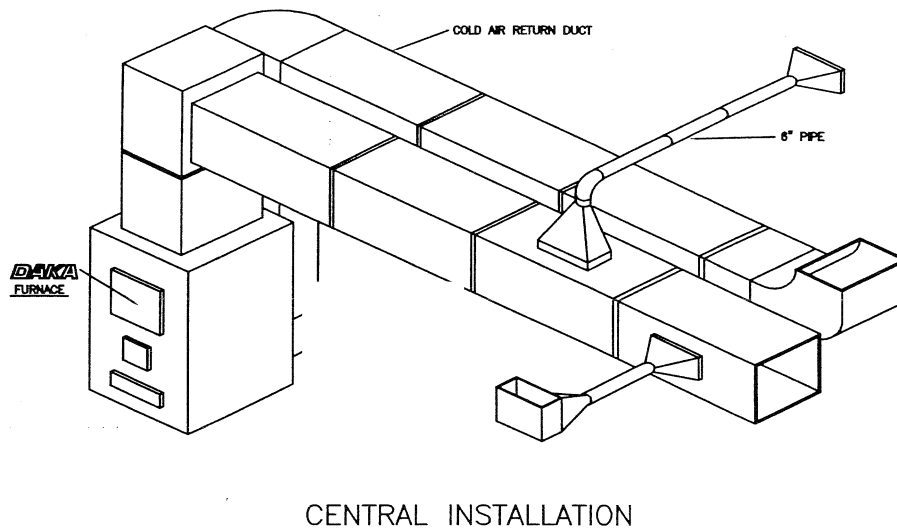
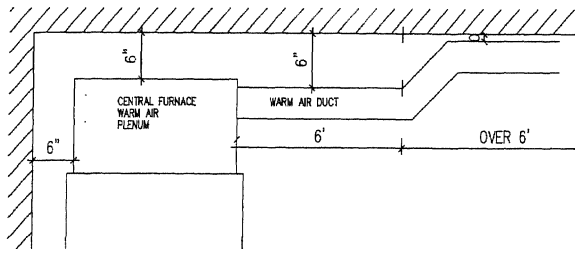


FIG. 3 – Clearances from Horizontal Warm Air Ducts



From Sides and Top of Warm Air Plenum – 6”
 From Horizontal Ducts within 6 Ft. of Plenum – 6”
 From Horizontal Ducts beyond 6 Ft. of Plenum – 0”

FIG. 4 – Clearances to Combustibles & Flooring

Wall Clearances to Combustibles:

- Furnace to sidewall: 18”
- Flue to sidewall: 27”
- Furnace to back wall: 32 1/2”
- Flue to back wall: 23”
- Furnace to front wall: 48”

FIG. 4A

Dimensions shown are minimum distances to stay clear from combustible walls.

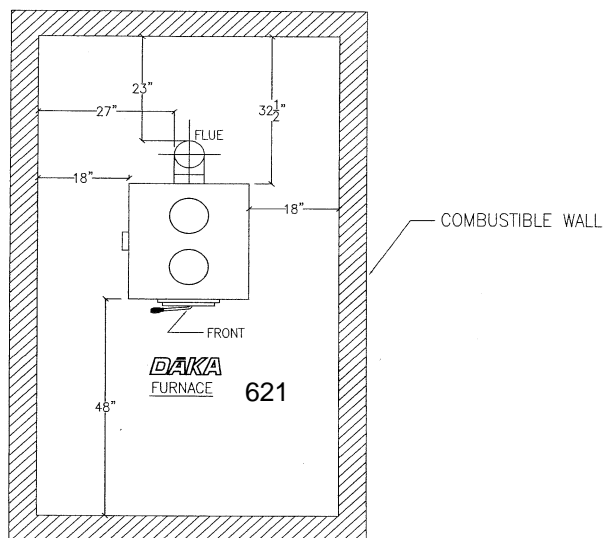


FIG. 4B

Dimensions shown are minimum clearances for floor protector or non-combustible floor.

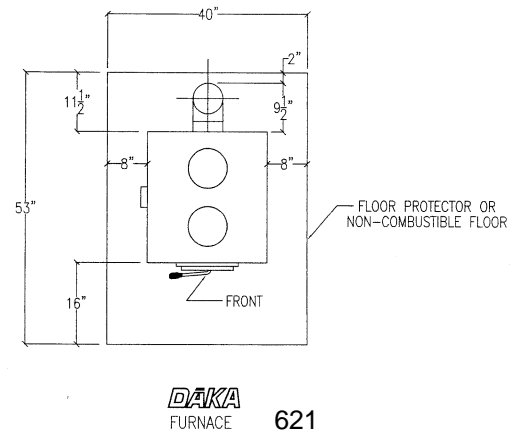


FIG. 5 – Alternative Warm Air Plenum Pipe Insert Designs

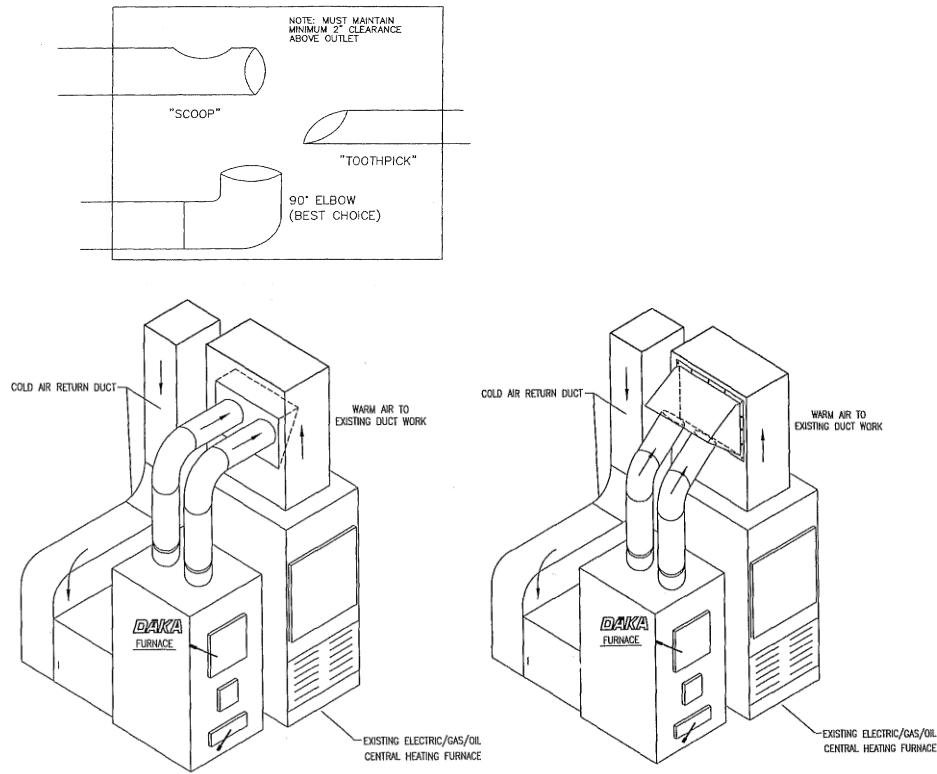
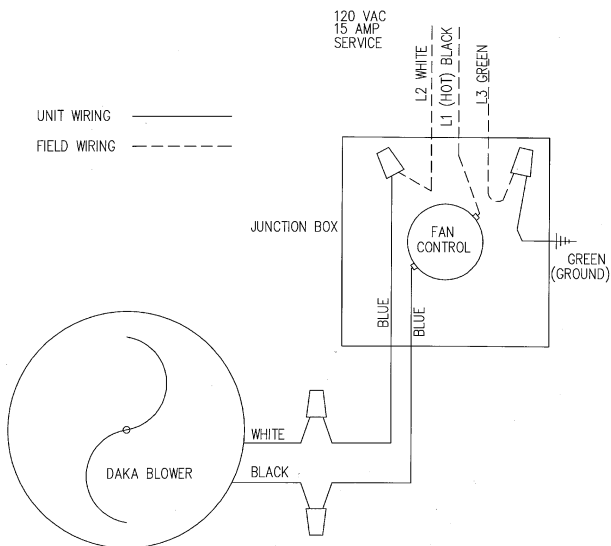
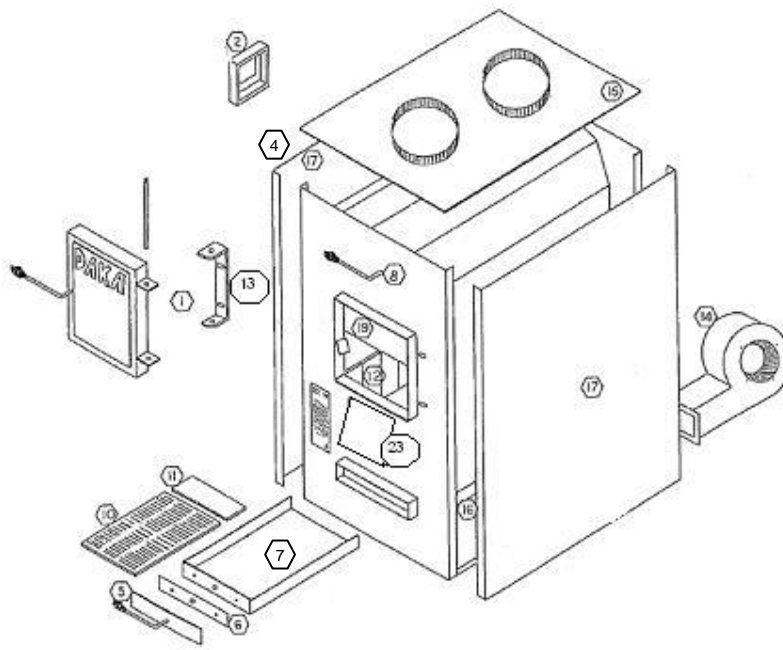


FIG. 6 – Wiring Schematic





KEY

No.	Part Description	Part No.	Qty
1.	Fire Door Assembly Fire Door Gasket	34200 57610204	1 1
2.	Junction Box Assembly - 4x4 (A)	33100	1
3.	Number not used	-	-
4.	Snap Disc Fan Control (B)	-58640000	-
5.	Ash Door Assembly	35100	1
6.	Thermal Gasket - Ash Door (A)	57610202	1
7.	Ash Pan Assembly	35400	1
8.	Bypass Damper Rod & Plate	57590214	1
9.	Number not used	-	-
10.	Cast Iron Grate	59650001	1
11.	Grate Spacer (A)	57660001	1
12.	Firebrick	57600001	15
13.	Hinge Assembly (A) Bolt Bag (B)	30720 36212	1
14.	Blower - 550 cfm	63610004	1
15.	Air Jacket - Top Panel	64590210	1
16.	Air Jacket - Bottom Panel	64590208	1
17.	Air Jacket - Side Panel	64590209	2
18.	Number not used	-	-
19.	Swing Plate (A)	57590211	1
20.	Number not used	-	-
21.	Number not used	-	-
22.	Number not used	-	-
23.	Auto Damper Assembly	32200	1
	Flexible Conduit w/wires (A)	62630407	2
	Wire Set [inside conduit] (A)	60670006	1
	Wire Nut (B)	62630802	4
	Sheet Metal Screw #12 x 1/2" (B)	61660208	14
	Crimp. Term. 1/4" Female 14 ga. (B)	62670205	2
	Conduit Connector - Straight (B)	62670201	2 (01)
	Conduit Connector 90° (B)	62670202	or 1 ea
	Hex Bolt, 1/4 x 3/4 for ash pan door (B)	H1434	2
	Hex Nut, 1/4 for ash pan door	HN14	2

A = Large Parts Bag #36205
 B = Small Parts Bag #36210
 All other parts are separate components

LIMITED WARRANTY

DAKA Corporation warrants the combustion chambers of its supplementary furnaces to be free of defects in material or workmanship for five years from date of sale; all other components, including electronics, gaskets and grates are covered in the same manner for a period of one year.

DAKA will repair or replace defective components, at our option, at no charge for parts and labor, and will pay freight charge for one-way shipment for warranty claims during first year. In second and subsequent years, only parts and labor will be provided at no charge. DAKA is not responsible for installation or dismantling costs.

Warranty void if unit is used in other than residential service connected to conventional basement-type up flow central heating system, if non-approved fuels are used in firing of units, or if unit is damaged due to accident, improper installation or negligence.

For service under this warranty, contact selling dealer or DAKA Corporation, Customer Service Dept., 955 Industrial St NE, Pine City MN 55063; Telephone (320) 629-6737.

Implied Warranties including that of merchantability are expressly limited in duration to the duration of this warranty. DAKA Corporation disclaims any responsibility for consequential damages. Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so this limitation and exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

This is our exclusive written warranty.