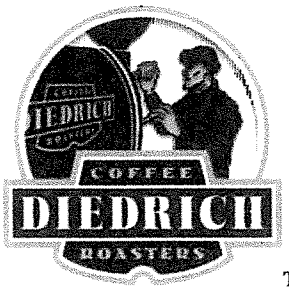

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"The Difference is in the Detail"

DIEDRICH COFFEE ROASTER

OWNER'S MANUAL

For Model IR-3 Floor Mount and Table Top

READ THIS MANUAL

for important safety, installation, operation and maintenance instructions.

Keep this Manual with the Roaster at all times and locate it in a prominent place.

Reissued: January, 2003

DIEDRICH MANUFACTURING, INC.
P.O. Box 1708
24 Emerald Industrial Park Road
Sandpoint, ID 83864

Telephone: (208) 263-1276
FAX: (208) 265-4584

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PREFACE

This Owner's Manual covers installation, operation and maintenance as well as important safeguards of your IRC-7 Diedrich Coffee Roaster. Information described reflects current production and operation of the Roaster.

This Manual should remain with the Roaster at all times and should be located in a prominent and accessible place. If you have any questions about the Roaster that are not answered in this Manual, contact Diedrich Mfg. Inc.

Persons operating the Diedrich Coffee Roaster must be familiar with this Manual and the safeguards, operating, cleaning, maintenance, fire prevention and fire control instructions described on the following pages.

Over the years, Diedrich Coffee Roasters have undergone an evolutionary design process. As new technologies have become available they have been incorporated. As the demands of the modern market have changed, Diedrich Mfg. Inc. has found ways to meet them while maintaining the fundamental principles by which premium coffee is roasted for maximum quality in taste.

This Manual is not necessarily intended to teach one how to roast coffee but does describe the proper techniques to operate the Diedrich Coffee Roaster.

1.0 IMPORTANT SAFEGUARDS

Proper installation, cleaning and safe operation of the Coffee Roaster is the owner's and operator's responsibility. Read this "Owner's Manual" carefully for important operation, maintenance and safety information.

1.1 This Owner's Manual must be kept with the Roaster at all times and be located in a prominent, easily accessible place. The Manual's contents must be reviewed at a regularly scheduled time by all persons authorized to use the Roaster.

> ***CAUTION - Always be aware of the risk of a fire. Fires are caused by failure to maintain a clean Roaster and its exhaust duct system. A dirty Roaster will also affect the efficiency of the roasting process. We cannot over-emphasize the importance of a safe installation that is kept clean!***

The Roaster's internal compartments should be cleaned on a daily basis and thoroughly cleaned after every 3-4 hours of roasting. More frequent cleaning may be required if chaff and residue build-up becomes excessive. Refer to Section 9.0 Cleaning for detailed instructions.

1.2 Always have accessible by the Roaster, a fire extinguisher of proper capacity. Consult with your local fire marshall for their recommendations of a suitable fire extinguisher.

1.3 **Never** leave the Roaster unattended while it is operating...from the start-up to the shut-down, and not until the drum chaff tray and the lower compartments are cleaned.

1.4 **Never** permit an unqualified person to operate the Roaster. A qualified operator will have thoroughly read this Manual, have a clear understanding of operation, roasting, cleaning, fire prevention procedures and observes all safety precautions.

1.5 **Never, under ANY circumstances while operating or servicing the machine, thrust a hand or arm into the roasting drum or any other access port** until the Roaster is switched OFF and disconnected at its electrical source.

1.6 Keep clear of moving parts such as the drum chain at the rear of the Roaster and the agitator arms and brushes in the cooling bin. Injury can result from snagged, loose clothing, jewelry, hair or fingers.

1.0 IMPORTANT SAFEGUARDS (continued)

1.7 Keep your customers clear of the Roaster when it is operating. They may not be aware of potential hazards.

1.8 Keep roasting area clear and free of combustible material, such as gasoline and other flammable vapors and liquids.

1.9 During and after the roasting, take care when touching the Roaster's exterior surfaces. The upper half of the front plate, can be very hot while it's lower half is usually very warm. The painted cowling encasing the roasting drum is warm to the touch during roasting. The cooling bin becomes hot when cooling freshly roasted beans.

1.10 **FIRE CONTROL - Be sure to read and understand. PRACTICE!! (see Section 11.0).**

REMEMBER...IF YOU DON'T HAVE A COMBUSTIBLE, YOU WON'T HAVE A FIRE!!

KEEP YOUR ROASTER CLEAN!!

DIEDRICH IRC-7 ROASTERS

TECHNICAL SPECIFICATION				
	TABLE TOP		FLOOR MOUNT	
CAPACITY RANGE	1-7 LBS. / BATCH - 30 LBS. / HR.		1-7 LBS. / BATCH - 30 LBS. / HR.	
ROAST TIMES	13-17 MIN.		13-17 MIN.	
WEIGHT (UNCRATED)	263 LBS. / 119.55 KGS.		360 LBS. / 163.7 KGS.	
GAS CONSUMPTION	12,000 BTU / HR.		12,000 BTU / HR.	
GAS INLET	1/2 IN. / 1.27 CM.		1/2 IN. / 1.27 CM.	
EXHAUST AIR	132 CFM / 3.7 CU. METERS / MIN.		195 CFM / 5.52 CU. METERS / MIN.	
EXHAUST DIAMETER	5.0 IN. / 10.16 CM.		5.0 IN. / 10.16 CM.	
VOLTAGE	110 V. / 50-60 OR 220 V. / 50-60		110 V. / 50-60 OR 220 V. / 50-60	
AMPERAGE	5.8	3.0	7.0	4.0
	TABLE TOP		FLOOR MOUNT	
	IN.	CM.	IN.	CM.
A. OVERALL LENGTH	32.5	82.55	32.5	82.55
B. OVERALL HEIGHT	37.625	95.57	68.0	172.72
C. BASE WIDTH	25.5	64.77	25.5	64.77
D. CHAFF CYCLONE DIA.	11.5	29.21	N/A	N/A
E. COOLING BIN HEIGHT	11.0	27.94	41.0	104.14
F. EXHAUST OUTLET	28.0	71.12	23.375	59.37
G. GAS INLET	2.5	6.35	32.0	81.28

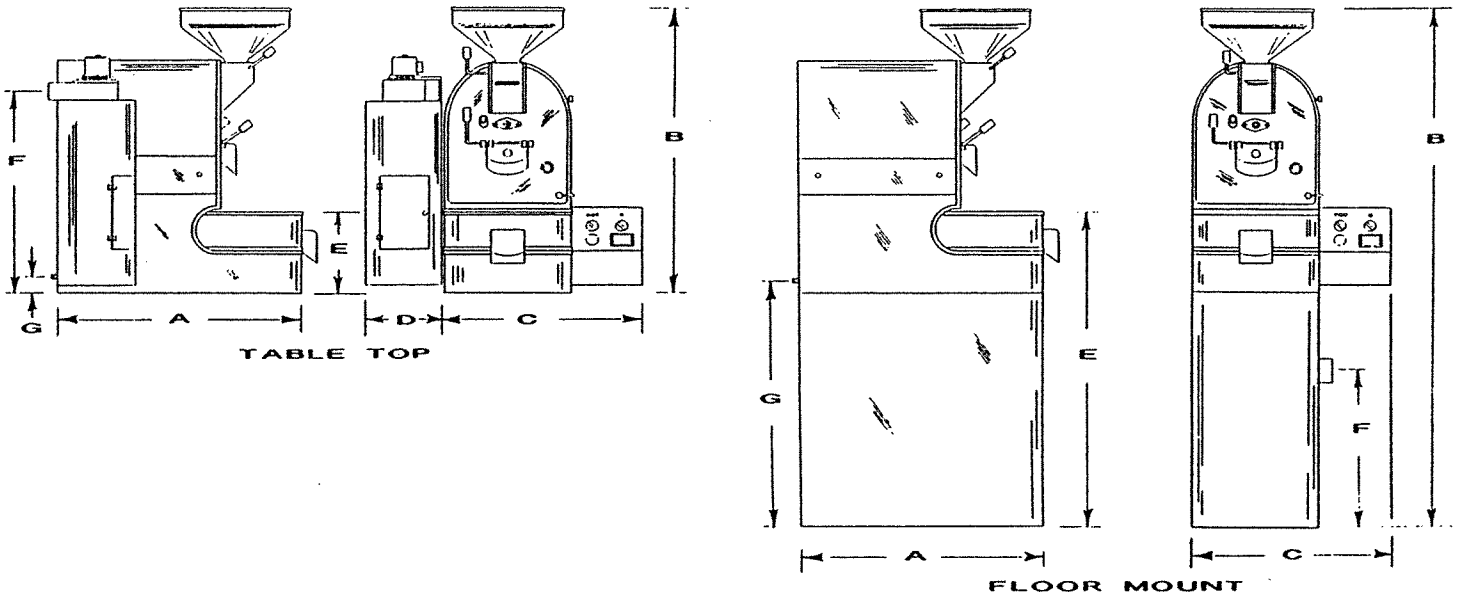


Figure 1

IRC-7 WIRING DIAGRAM

(INTENTIONALLY LEFT BLANK)

PLEASE SEE THE WIRING DIAGRAM LOCATED ON THE INSIDE ELECTRICAL PANEL OF YOUR ROASTER.

2.0 INSTALLATION INSTRUCTIONS

IMPORTANT: The Diedrich Coffee Roaster is designed and manufactured for ease of installation and simplicity of operation. However, professional installation is required. The installer should read the instructions completely before starting the installation to save time, insure good performance and insure owner's warranty protection.

2.1 RECEIVING AND UNPACKING SHIPMENT

When the roaster is received, immediately check for crate damage. Do not refuse shipment if damage is evident. Make notes of such on the appropriate shipping forms. Uncrate and look for damage to the Roaster i.e., dents, scratches or chipped paint, and if found, immediately file a claim with the appropriate freight carrier. Photo documentation of damaged areas is suggested!

In your shop or restaurant, if possible, locate the Roaster where its operation and coffee roasting can be observed in natural light or under consistent light conditions. To detect the true color changes which beans undergo during roasting, natural light is essential for best results. For consistency in roasting, the use of a full spectrum fluorescent light to simulate the full color of sunlight, is recommended.

2.2 LEVELING THE COFFEE ROASTER

The roaster must be mounted on a flat, non-combustible floor. A combustible floor requires a fire-proof insulation on the floor areas occupied by the Roaster. The floor must meet weight-bearing requirements of local codes for commercial buildings.

The gross weight of the Floor Mount unit with maximum load of coffee beans is 366 pounds.

The gross weight of the Tabletop unit with maximum load of coffee beans is 269 pounds.

It is recommended that the Floor Mount model be bolted to the floor to keep the roaster stable. About two-thirds of the weight of the roaster is in the upper portion of the machine.

2.0 INSTALLATION INSTRUCTIONS

2.2 LEVELING THE COFFEE ROASTER (continued)

Careful leveling of the Roaster is critical not only for performance but for safety. Use a carpenter's level.

For side to side leveling, set level cross-ways on top of the cooling bin. Shim Roaster as required to level.

For front-to-back leveling, set level lengthwise on top of cooling bin (at 90 degrees from side-to-side leveling). Shim Roaster as required to level.

Non-combustible shims are required under the Roaster.

The Tabletop model is leveled with leveler feet.

2.3 PROXIMITY TO WALLS

Due to the intended use of the Roaster, clearances to combustible or non-combustible walls or counters given below must be followed to insure adequate cooling of the Roaster and adjacent walls. Failure to abide by these clearances will void the manufacturer's warranty.

2.3.1 Clearance from the Roaster to adjacent walls, counters or other appliances must be a minimum of 18-inches or more. No cabinets or storage areas are to be installed over the Roaster or near the ducting.

2.3.2 Clearances required for Class A Positive Pressure Exhaust Ducting will vary among manufacturers. Therefore, Diedrich's specified minimum clearances of 4-inches from non-combustibles and 10-inches from combustibles must be followed wherever duct manufacturer's clearances are less.

2.3.3 Make sure all controls, access doors and removable panels on the Roaster are accessible and without restrictions to hinder their complete movement.

2.4 GAS INSTALLATION

Use a locally licensed heating contractor or the gas company for the gas line installation.

2.0 INSTALLATION INSTRUCTIONS

2.4 GAS INSTALLATION (continued)

Installation must conform with applicable city, county or federal codes, and in the absence of codes, the National Fuel Gas Code ANSI Z-233 or its latest edition must be followed.

In Canada, installation must conform with current CAN/CGA B149.1 & 2 Gas Installation Codes and/or applicable local codes.

The gas supply line must be the same size or larger than the Roaster's inlet size. If needed, use a reducer fitting. All pipe used for the installation must be at least Schedule 40 pipe. Sealant on pipe joints must be resistant to Liquid Propane.

A water trap to collect condensation and loose particles should be installed in the last vertical gas supply line upstream from the Roaster.

2.4.1 SAFETY SHUT-OFF VALVE

A safety shut-off valve must be installed in the gas supply line close to the Roaster and pressure regulator and in a location where it can be reached quickly in an emergency. In an emergency any operator, qualified or not, can turn off the gas flow to the Roaster. Valve must be UL, AGA and/or CSA approved.

2.4.2 PRESSURE REGULATOR

A pressure regulator is required on the incoming gas supply line between the safety shut-off valve and the Roaster's gas inlet for a safe and efficient operation, since service pressure may fluctuate with local demand. Set regulator for 5-inch water column pressure for Natural Gas or 11-inch water column pressure for the Liquid Propane (LP).

Note: The Roaster is prepared at the Diedrich factory for Natural Gas or LP, as specified by the customer at the time of the order.

2.0 INSTALLATION INSTRUCTIONS (continued)

2.4.3 FLEXIBLE CONNECTIONS

If the Roaster is to be installed with flexible couplings and/or quick-disconnect fittings, the installer must use a heavy-duty, AGA design-certified commercial flexible connector of at least 1/2" NPT (with suitable strain reliefs) in compliance with ANSI Z-21.69-1987.

Before plumbing hook-up, double check any installer supplied pipes, shut-off valve and pressure regulator for dirt particles, threading chips or any other foreign matter. Use compressed air for cleaning. Any particles of foreign matter will clog burner orifices when gas pressure is applied.

2.4.4 GAS INSTALLATION CHECK-OUT

Before placing the Roaster in operation, always check connections for gas leaks with soapy water solution or other acceptable method. **DO NOT USE AN OPEN FLAME TO CHECK FOR LEAKS!**

Line pressure should be checked with a manometer; Natural Gas requires 5-inch water column pressure (WCL) and Propane requires 11-inch water column pressure (WCL). Incoming line pressure upstream from the regulator must be 1-inch WCL higher than the manifold pressure in order to check the regulator. The pressure regulator used on this Roaster can withstand a maximum input pressure of 1/2 PSI (14-inch WCL). If the line pressure is in excess of that amount, a step-down regulator will be required.

The Roaster must be isolated from the gas supply line by closing its safety shut-off valve during any pressure testing of the gas supply line at test pressures equal to or less than 1/2 PSI.

Before hook-up to Roaster, open shut-off valve for gas flow to bleed air out of the gas supply line. This insures prompt ignition of the burners the first time for fire-up of the Roaster. After bleeding, close shut-off valve.

Do not remove permanently affixed labels, warnings or rating plates from the Roaster or from its components as this will void manufacturer's warranties and create hazardous operating conditions.

2.0 INSTALLATION INSTRUCTIONS (continued)

2.4.5 WARNING LABELS

WARNING
IF THE INFORMATION IN THIS DIEDRICH ROASTER OWNER'S MANUAL IS NOT FOLLOWED EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR DEATH

1. **Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this Roaster or any other appliance.**
2. **WHAT TO DO IF YOU SMELL GAS:**
   Do not try to light any appliance.
   Do not touch any electrical switch; do not use any phone in your building.
   Immediately call your gas supplier from your neighbor's phone.
   Follow the gas supplier's instructions.
   If you cannot reach your gas supplier, call the fire department.
3. **Installation and service must be performed by a qualified installer, service agency, or the gas supplier.**

WARNING
If this Roaster is not installed, operated and maintained in accordance with the Diedrich Roaster Owner's Manual, you could be exposed to substances in fuel or from fuel combustion which can cause death or serious illness and which are known to cause cancer, birth defects or other reproductive harm.

For example, benzene is a chemical which is a part of the gas supplied to the cooking product. It is consumed in the flame during combustion. However, exposure to a small amount of benzene is possible if a gas leak occurs. Formaldehyde and soot are by-products of incomplete combustion. Properly adjusted burners with a bluish rather than yellow flame will minimize incomplete combustion.

These warning labels should be copied and posted in a prominent location for use in case the user smells gas.

2.0 INSTALLATION INSTRUCTIONS (continued)

2.5 ELECTRICAL INSTALLATION

Use a locally licensed electrician for the electrical installation.

The Roaster must be in accordance with local codes, or in their absence, the National Electrical Code, ANSI/NFPA70-1990 or its latest edition. In Canada, the electrical installation must be in accordance with current CSA C22.1 Canadian Electrical Code part 1 and/or applicable local codes.

The roaster must be connected to a properly grounded electrical source. The source must be polarized, grounded, 120 volts A.C., 60 hz, 8 amps circuit designated to the Roaster **or** 220 volts A.C., 50/60 hz, 5 amps for 220 volt models. Check data plate for proper requirements. The electrical supply must be appropriately rated for the Roaster model.

WARNING: If the electrical source is not grounded or if the polarity is reversed, severe shock hazard will exist. All components in the Roaster are grounded electrically to the Roaster frame.

It is recommended that the power cord be plugged into an outlet with a safety disconnect switch.

2.6 ROASTER EXHAUST DUCTING

Review applicable city, county, state or federal building codes. Class A Positive Pressure Exhaust Ducting is required from the Roaster's exhaust outlet to the outside air. If the duct run exceeds 6 feet, a 6-inch diameter duct or larger will be needed.

USE ONLY DOUBLE-WALL, CLASS A POSITIVE PRESSURE GREASE DUCTING OR SINGLE-WALL, WELDED SEAM 18-GAUGE STEEL DUCTING.

WARNING: DO NOT USE CLASS B OR SPIRAL-WRAP DUCTING UNDER ANY CIRCUMSTANCES.

2.0 INSTALLATION INSTRUCTIONS

2.6 ROASTER EXHAUST DUCTING (continued)

DIEDRICH MFG., INC. REQUIRES THAT CLASS A POSITIVE PRESSURE GREASE DUCT SYSTEM IS INSTALLED WITH CLEARANCES TO NON-COMBUSTIBLES OF AT LEAST 4" AND AT LEAST 10" MINIMUMS OR GREATER TO COMBUSTIBLES.

2.6.1 The proper design of the exhaust duct system is critical to the performance and safe operation of the Roaster. The ducting must be of sufficient diameter to accommodate the cubic feet per minute (CFM) of airflow for your IRC-7 roaster as indicated on the data plate. The system should have no more than 1-inch maximum internal static pressure (WCL) for proper air flow requirements. Restricted air flow presents a severe fire hazard. ***For duct system design, consult with a local mechanical engineer.***

A faulty design of the exhaust ducting system can result in restricted air flow which, in turn, can cause longer roasting times, premature build-up of residue, slower cool-down times and a system that is difficult to clean as well as presenting a **SEVERE FIRE HAZARD.** Restricted air flow additionally causes a build-up of flammable gas in the roasting drum and the chaff collection system.

The ducting system must be suitable for 1100 degrees Fahrenheit (593 degrees Celsius) continuous and 1400 degrees Fahrenheit (760 degrees Celsius) intermittent operating temperatures. The ducting must be installed with clearances compatible to the manufacturer's specifications or with the Diedrich specifications, whichever is the greater of the two. Single-wall, steel ducting requires much greater minimum clearances; 15 inches to non-combustibles or 25 inches to combustibles (but may not meet local codes).

Wherever possible, the ducting should be installed in a straight, vertical line from the roaster to and through the roof. And terminated with the appropriate china cap.

Eliminate or minimize the number of elbows as they reduce the exhaust air flow efficiency from the Roaster's blower. Where using elbows make gradual turns. Minimize the use of 90 degree elbows. Each 90 degree elbow effectively increases the duct length by 5-10 feet. To obtain adequate air flow, use 45 degree elbows to construct gradual turns ***if the space is available.***

2.0 INSTALLATION INSTRUCTIONS

2.6.1 ROASTER EXHAUST DUCTING (continued)

If the duct run is longer than 6 feet, the duct diameter size may need to be increased by at least one inch diameter after the first 10 feet to improve air flow performance. A booster fan may be required at the end of the duct run; consult an air flow engineer.

Where ducting changes direction, use a tee or Y-fitting (capped) rather than an elbow to make the duct system more accessible for cleaning and for removal of exhaust residue.

2.6.2 EXHAUST DUCT SURROUNDINGS

Class A Positive Pressure Chimneys are primarily intended to be used in non-combustible surroundings and installed unenclosed. Do not enclose the ducting in a wood chase or passageway constructed with combustible material.

Where the duct extends through any drop ceiling or story of a building above that in which a roaster is installed, it must be enclosed with walls of non-combustible construction having a fire resistance rating of not less than one hour for buildings of two or three stories in height. Greater requirements are required for taller buildings. Check with duct manufacturer requirements or local codes.

Penetrating a combustible roof requires the use of a ventilated roof thimble or the appropriate roof support assembly required for combustible roof penetrations by the particular manufacturer of the duct being used.

Most Class A Positive Pressure vent systems weigh a considerable amount. Make certain that the duct is properly supported and that component parts are not over-loaded and that adequate auxiliary structural members are used.

Note: ***The weight of the exhaust system must <u>not</u>, under any circumstances, be supported by the Roaster.***

2.0 INSTALLATION INSTRUCTIONS (continued)

2.6.3 RECOMMENDED SOURCES

Positive Pressure Class A Chimney ducting and fittings.

A. Selkirk Metalbestos
P.O. Box 372
Nampa, Idaho 83653-0372
Telephone: (208) 467-7411

A Selkirk representative may be located in your area.

B. Other equivalent Class A Positive Pressure ducting sources may be available, but must meet or exceed the specifications of Selkirk Model PS Grease Duct System.

2.7 INSTALLATION INSPECTION

After completing hook-up of the exhaust duct system, gas and electrical connections, check the operating control panel. Be sure all switches and the flame control are in the OFF position.

Note: After completing the installation of the Roaster, locate two or more fire extinguishers near the Roaster and readily accessible to the operator. Consult with your local fire marshal for recommendation of an appropriate type fire extinguisher.

The completed Roaster installation MUST BE INSPECTED to these Diedrich installation instructions by local city or county building inspectors and by fire inspectors BEFORE OPERATING THE ROASTER.

3.0 INITIAL START-UP (for Drum Seating - read carefully)

Sometimes during shipment and installation, a slight shifting of the Roasting Drum and its end plates may occur to disturb alignment. Check for misalignment. Adjust Drum seating as follows:

3.0 INITIAL START-UP (continued)

3.1 Place air control handle in the "50%" (mid) position. Set blower and drum switches to ON positions. Flame control remains OFF. Listen for rubbing sounds. If rubbing is heard, stop operation and contact Diedrich Mfg. Inc., for instructions.

3.2 If no rubbing sound is heard with Drum still rotating, set Gas switch to ON. Move flame control to obtain a low flame setting.

Note: The first time the pilot ignites, extra time may be necessary to allow air to bleed out of the gas line. Following the pilot's ignition, watch through the Pyrex window for burner ignition.

3.3 Move flame control to obtain a medium flame setting while Drum continues to rotate. If rubbing sound is heard, stop operation and contact Diedrich Mfg. Inc., for instructions.

3.4 Move flame control to a high flame setting and watch the digital temperature unit on the control panel. Let Roaster warm to 350 degrees Fahrenheit, (177 degrees Celsius). If no rubbing sound occurs up to 350 degrees Fahrenheit, the initial warm-up is completed and the roasting can commence. If rubbing sound continues, stop operation and contact Diedrich Mfg. Inc., for instructions.

Note: ***During initial warm-up, DO NOT let Roaster heat exceed 350 degrees Fahrenheit (177 degrees Celsius) without coffee beans in the roasting drum.***

3.5 Check exhaust system for leaks. The vent that **MUST** be installed is a Positive Pressure System and if leaks are present, the integrity of the system is compromised. If leaks are present, the ventilation contractor must be notified to correct the situation before proceeding to the next step.

This completes the initial start-up procedure.

4.0 SEASONING THE ROASTING DRUM

Before you roast coffee for customer consumption in a new Roaster, the drum should be seasoned to get it impregnated with coffee oil. For this seasoning process, use an inexpensive coffee. Do not use Robusta coffee as it does not emit enough oil for the seasoning process nor will you be able to learn from the experience or get the proper feel for the roasting process.

The new drum requires between 5-10 seasoning roasts to become properly oiled. Each seasoning roast requires about 3 pounds of coffee, enough to fully cover the drum's lower surfaces. After completion of each seasoning roast, discard the roasted coffee after it cools. It may take additional roasts to achieve the best flavor from your new Roaster.

This drum seasoning process will give you the opportunity to become familiar with the Roaster's controls and the roasting process itself.

4.1 To start the seasoning, preheat the Roaster to 250 degrees Fahrenheit (121 degrees Celsius). Follow the initial steps for setting the controls noted in following paragraph 5.0 Start-Up. After preheating, load the coffee beans into the funnel, through the hopper gate and into the drum.

4.2 As the roast is started, move the air control handle from the "50%" (mid) position to the "Minimum" (all the way in) position. The coffee will change in color from green to a pale yellow. During this progression, look through the drum door view window. You will start to see chaff, the bean's outer skin, separating from the coffee bean. Unwashed coffees have considerably more chaff than washed coffees and decaf coffees have almost no chaff.

4.3 As the coffee develops from the green to the yellow stage and chaff is visible through the view window, the air control handle must be temporarily moved to the "Full" (all the way out) position so that the increased air flow will remove the chaff from the roasting drum. Leave the air flow control handle in the "Full" (all the way out) position, for a minute or so, until the coffee becomes clean, (free of chaff).

4.4 When the coffee is free of chaff, return the air control handle to the "Minimum" (all the way in) position. This procedure must be done once or twice during the early stage of the roasting. If the chaff is not vacuumed out of the drum in the early stage of the roast (before it is broken up and soaked with oil), it will become more difficult to separate from the beans; even with the increased air flows through the drum during the latter stage of the roast.

4.0 SEASONING THE ROASTING DRUM

4.4 (continued)

When chaff is broken up and soaked with the coffee oils the maximum air flow through the drum will have difficulty in removing the chaff, and excessive chaff will accumulate below the cooling screen.

4.5 When the coffee reaches the yellow stage, the air control handle must be moved to the "50%" (mid) position. As the coffee reaches the yellow stage, the moisture in the coffee that was a good conductor of heat early on in the roast, is now turning to steam. At this stage in the roast, the air flowing through the roasting drum becomes a more important and uniform heat medium.

The roast will progress from the yellow to the cinnamon color. At this stage, the coffee begins to expel a fair volume of carbon dioxide (CO_2) gas, requiring even more vacuum. At this point, pull the flow control handle to the "Full" (all the way out) position.

4.6 After the cinnamon color stage of the roast is reached, the coffee will start its first cracking. It is important to move the maximum amount of air through the Roasting Drum for the remainder of the roast.

When the bean temperature reaches 415 degrees Fahrenheit (213 degrees Celsius), an alarm buzzer will sound. This alerts the operator that the roast now requires full attention! The alarm does not shut-off the gas or change anything. It's sole purpose is to alert the operator. To turn off the alarm buzzer, press the Alarm Reset button.

When the temperature reaches 475 degrees Fahrenheit (246 degrees Celsius), the Hi Limit automatically turns off gas flow to the burners. This, however, does not stop the temperature rise, as the coffee's exothermic reaction will continue to increase the coffee's temperature to the point where the coffee could ignite. The temperature will have to recede below 450 degrees Fahrenheit (232 degrees Celsius) before the burners can be re-lit.

4.7 Let the roast progress in the full roasting stage until the coffee develops through the second crack, and oil begins to appear at the tips of the beans.

When you begin to notice the first traces of oil, turn the flame control OFF. Let the coffee roast in its own liberated heat until the beans are fully oiled and almost black. Under good lighting, you want to still see some brown in the coffee. When the coffee is almost black and fully oiled, discharge the coffee into the cooling bin, while moving the air control handle to the "Minimum" (all the way in) position.

4.0 SEASONING THE ROASTING DRUM (continued)

When the coffee temperatures approach 420 degrees Fahrenheit (215 degrees Celsius), an **exothermic reaction** occurs. This means that the chemistry creates its own heat. Thus, you will see the temperature rise an additional 80 to 100 degrees Fahrenheit (26-38 degrees Celsius) after the gas is turned off. This temperature rise will activate the Hi Limit, requiring the latter to be reset prior to starting the next roast.

4.8 Load the next batch of green beans into the drum. After the coffee is in the drum, turn on the flame to start the next roast. Repeat this complete dark roasting (18-20 minutes) 5-8 times, then start to develop lighter (15-18 minutes) roasts. This procedure will properly season the roasting drum.

This completes the procedure of seasoning the roasting drum.

5.0 START-UP (for Roasting)

5.1 Place air control handle to the "50%" (mid) position.

5.2 Set blower and drum switches to ON.

Note: The heating system is wired through the blower and drum motors so that both must be on before the gas system is activated.

5.3 Set gas switch to ON.

5.4 Move flame control to HIGH (temperature) setting for warm-up. For burner ignition, watch through lower front Pyrex window.

5.5 After burner ignition, move the air control handle from "50%" (mid) to "Minimum" (all the way in) position. The handle remains in this position throughout the early part of the roast.

5.6 Preheat the empty drum until the temperature indicates 250-350 degrees Fahrenheit (121-176 degrees Celsius). The digital temperature unit's thermocouple is mounted on the back of the roasting drum. During the initial start-up the temperature reading indicates the air temperature inside the empty drum, not the higher temperature of the drum's metal surfaces, the latter a corresponding 400-450 degrees Fahrenheit (204-232 degrees Celsius).

This completes the Start-Up (for roasting) procedure.

6.0 ROASTING

These instructions explain how to operate the Roaster. They are not an attempt to teach all the subtleties and proper techniques of roasting the many different varietals of coffee beans.

Recommended roasting times are from 14-15 minutes for a light roast, and 15-18 minutes for a darker roast, depending on the type of beans. If the beans roast too fast, reduce the flame during the roast. The temperature of the roasting system (comprised of the coffee beans, roasting drum, and the end plates) reacts slower than the flame adjustments. Hence, do not expect a quick temperature change when the flame setting is changed.

By using the sample trowel to obtain samples, you can observe the change in bean color and its state of development during roasting. By referring to a set of previously roasted bean samples or color tiles and time frames, you can develop a consistent roast profile that best suits a particular varietal. Once a profile has been developed, keep it consistent. Otherwise the coffee's taste will change from roast to roast.

Sampling of beans should be consistently viewed under a ***full spectrum natural fluorescent lamp,*** regardless of day or night or overcast natural light, to maintain a consistency of sample comparison.

6.1 After the Roaster's empty drum has been preheated to a thermometer reading of 250 to 300 degrees Fahrenheit (121-149 degrees Celsius) temperature use the funnel to load the unroasted beans into the hopper. **Never allow the beans to sit any length of time in the hot metal hopper** as this will result in pre-roasting, uneven roasting or even scorching of the beans. If you exceed 300 degrees Fahrenheit (149 degrees Celsius) when first warming up the Roaster, most coffees will scorch.

Move the hopper gate handle up to release the green beans from the hopper into the drum. Move the handle down to close the hopper gate. If the hopper is not closed after loading, heat will be lost and roasting times will be longer.

6.2 Adjust the flame to an appropriate setting for the size of the batch being roasted. The larger the batch, the greater the heat required and the higher the flame can be raised without accelerating the roast times.

6.3 To start the roasting process, move the air control handle to the "Minimum" (all the way in) position. This regulates the air flow: 20% through the drum and 80% through the cooling bin. This allows sufficient air flow through the drum to gently assist in the heating process without drying out the coffee excessively. The Diedrich Coffee Roaster utilizes the moisture that is present in the green coffee (an average of 11%) to assist in the conduction of heat to the center core of the

green coffee bean. Thus, we do not like to force large volumes of hot dry air through the coffee which, in turn, will dry the coffee out excessively.

6.4 Watch through the drum door window for the separation of chaff from the beans. Move the air control handle to the "Full" (all the way out) position. This regulates the air flow: 70% through the drum and 30% through the cooling bin. This greater flow of air through the drum exhausts out the chaff which is shedding from the beans. The Diedrich Coffee Roasters allows the beans to absorb heat at their own natural absorptive potential, as various types of coffee have different weight densities and absorb heat differently. The medium can be adjusted to best suit a particular varietal.

Leave the air control handle in the "Full" (all the way out) position until the coffee appears clean. It is important to get the chaff out of the drum at this early stage, before it gets broken up and soaked with oil. It is relatively easy for the air to pick the chaff up when the particles are big and light but more difficult later on in the roast when the chaff gets broken up and saturated with oil.

This chaff removal procedure is very important especially when working with those coffee varietals that have very heavy chaff coatings. Decaf coffee has no chaff on the exterior of the bean, so this procedure becomes unnecessary.

6.5 Between 45-60 seconds when the beans are fairly free of chaff, move the air control handle back to the "Minimum" (all the way in) position. Leave the handle in this position until the beans reach a yellow color.

The yellow color of varietal coffees is an off-shade of orange for decaf coffees. This is a stage of roast that is easy to identify, so it makes a good reference for time.

You should be into the roast ***six to seven minutes*** when the coffee reaches this yellow color. This will put you right on target for a finish time of 15-18 minutes. If you are at six minutes, but far from the yellow color, the coffee will require more heat. If you are at four minutes and the coffee is already turning yellow, you will need to reduce the heat. Think of the flame control as the speed control.

6.6 When the beans have reached the yellow color, move the air control handle to the "50%" (mid) position until the beans reach a cinnamon brown color.

The cinnamon brown color is another check point that is easily identifiable. You should reach this color at 13-14 minutes. If you hit the yellow stage at the right time, you should be fairly close, but some fine tuning of the heat may be necessary at this point.

As the beans reach the cinnamon brown color, the chemical changes in the coffee start to produce a large volume of carbon dioxide (CO_2) gas. This gas will pressur-

6.0 ROASTING

6.6 (continued)

ize the roasting drum if the air flow is not increased. Normally, a pressurized roasting vessel is the most efficient heat transfer medium, but for coffee, a pressurized roasting drum will hinder bean development. Thus, more vacuum through the drum is needed so the air control handle is placed in the "Full" (all the way out) position.

The darker the roast, the more smoke is produced. This requires a greater air flow to keep clean air moving through the drum. After about 15 minutes of roasting time, observe the gradual color change of the beans from cinnamon brown to brown. Use the sample trowel to obtain sample beans to observe bean development.

Soon after the beans have reached the cinnamon brown color, they will come into the first crack. This is the most significant stage of bean development. At this stage, the beans fully open up, and for a lighter roast, the roasted coffee may be ready to release into the cooling bin.

All coffees should be roasted fully through the first crack. Now the roast progresses very quickly. The operator should pay close attention to the coffee. Frequent sampling is most important. ***These last few minutes are very critical as the bean development accelerates very rapidly.*** While learning to roast, it may be advisable to lower the heat to slow down this stage of the roast.

6.7 When the coffee reaches this final stage of roast, prepare to discharge the roasted coffee into the cooling bin. Turn the agitator motor ON, move the air control handle to the "Minimum" (all the way in) position and turn the flame OFF. Then, all that remains is to discharge the coffee into the cooling bin.

NEVER LEAVE THE FLAME ON WITHOUT COFFEE IN THE ROASTING DRUM.

Since roast batches are small, the coffee in the cooling bin will cool down faster if the agitator is stopped after a minute or two and the coffee is spread out evenly on the screen.

The reason for stopping the agitator and evenly spreading the coffee, is that the exposed screen behind the brushes makes an easier path for the cooling air to circulate rather than the cooling air flowing through the hot coffee. Covering up the holes will even out the vacuum under the cooling bin screen.

6.0 ROASTING

6.7 (continued)

While the drum discharge gate is open, wipe clean the viewing window. It is much easier to clean residue from the window while it is hot rather than letting the residue bake on and harden during the cooling.

Note: After completing the first roast, the drum metal temperature will be about 440 degrees Fahrenheit (226 degrees Celsius), the same as indicated on the digital temperature unit. This allows the next roast to be started immediately without the need to cool the Roaster back down to 250-300 degrees Fahrenheit (121-149 degrees Celsius).

When the beans have cooled to room temperature, open the cooling bin chute to discharge the roasted beans into an appropriate container. Set agitator switch to OFF.

6.8 **Note:** During any phase of the roasting process, if excessive smoke flows into the room, if smokes comes out of the sample trowel port, or if after the roast the discharged beans require longer cooling time than usual, check for excessive build-up of residue throughout the air flow system within the Roaster and in the exhaust ducting. If, at any time during roasting, these abnormalities occur, inspect the Roaster and ducting for probable cause and take immediate action to rectify the situation. Refer to Section 9.0 Cleaning.

This completes the roasting procedure.

7.0 **SHUT DOWN** (after last roast)

7.1 Set gas switch to OFF

7.2 After the roasted beans in the cooling bin have cooled to room temperature, move the air control handle to the "Full" (all the way out) position to cool the drum and roasting sections of machine. Roasted and cooled beans are ready for removal from the cooling bin through its chute.

7.3 After the temperature reading has dropped to 250 degrees Fahrenheit (121 degrees Celsius) or lower, set the blower and drum switches to OFF. Turn flame control to OFF, if not already in the OFF position.

7.4 Remove the chaff from the lower compartment or cyclone. Open the side doors and clean the burner area. Inspect for smoldering chaff. If found, extinguish with a water spray bottle. Vacuum out the cooled chaff.

NEVER LEAVE THE ROASTER AFTER ROASTING WITHOUT CLEANING OUT THE CHAFF FROM THE CYCLONE OR THE LOWER COMPARTMENT.

7.5 **Note:** For faster cooling of the Roaster, leave all compartment doors closed. This moves air throughout the complete roasting section, rather than leaving the drum door open and just cooling the drum down. If the Roaster is cooled with hopper and drum door open and shut down, once the doors are closed you will notice an immediate rise in temperature. The temperature will rise back up to beyond 350 degrees Fahrenheit (177 degrees Celsius) as all of the insulation and all the metal in the top end of the Roaster still retain considerable heat.

This completes the shut-down procedure.

8.0 ROASTING AND CLEANING LOG - See Figure 3, Table A

Diedrich recommends that you maintain a Roasting and Cleaning Log. This Log will assist in keeping track of the amount of coffee roasted during the course of the day, week or month; how long the machine has been working since the last cleaning or maintenance, and how much weight has been lost from the green to the roasted beans. You will find the Log very valuable for many different aspects of the roasting process.

It is a good idea to get into the habit of making entries into the Log between roasts or after the green coffee has been discharged into the roasting drum before the coffee roast requires all your attention.

8.1 **Type of Coffee:** The type of coffee is important, as Naturals (unwashed coffees, i.e. Indonesians) have much more chaff than washed coffees (i.e. Central and South American coffees); and decafs have virtually no chaff on the outside of the bean. Thus, the chaff box and burner tray require much more attention if a fair quantity of Sumatra is roasted, but almost no cleaning if you are roasting decaf.

8.2 **Weight Loss:** The green weight IN minus the roasted weight OUT divided by the green weight, equals the percentage of weight loss.

The weight loss is a good indicator of the degree of roast. For example, take a coffee that has a 15% weight loss. Such variables as humidity, how the coffee was stored and ambient air temperature, will affect the weight loss. It may go up or down 1% from day to day or month to month, but you should always see **15%** **1%**. If, after a few months, you start to see the weight loss moving to **16-17%**, the roast is gradually getting darker. On the other hand, if the weight loss starts to drop down to **13-14%**, the roast is gradually getting lighter.

8.3 **Roasting Times:** Roasting times for a particular roast are also important. This may explain why the weight loss is different from the last time a particular coffee was roasted (the longer the roast, the higher the weight loss) even if the color is the same. Longer roast times and cooling times are also indicators that the air flow passages may be plugging up. Roast times are also important to calculate total time on the Roaster.

8.4 **Total Time:** Total time on the Roaster is very important as it directly relates to the servicing/cleaning needs of the Roaster.

8.0 ROASTING AND CLEANING LOG - See Figure 3, Table A (continued)

8.5 Comments: This is a good place for notations about techniques required for particular coffees or any type of comment that you feel is important. It may also be wise to note the weather of the day, as climatic and elevation conditions vary and will affect the way some coffees roast.

It is useful to note any changes in the way the Roaster performs. This will be helpful in diagnosing future problems with the Roaster.

8.6 Cleaning and Servicing: Use this column of the Log for what, when and who serviced the Roaster.

Date	Type of Coffee	Green Wt IN (lbs.)	Roasted Wt. OUT (lbs.)	Percentage Wt. Loss (see note)	Roasting Time (Minutes)	Time Totals	Comments	Cleaning & Service Schedule
9/15	Guat. Antigua	15	12.75	15	17		DID NOT TAKE HEAT WELL	
9/15	Col. Supremo	25	21.5	14	18		Roast SHADE DARKER Next time	
9/15	Costa Rica	25	21.3	14.8	18		Good Bean Devel.	
9/15	Costa Rica Decaf	10	8.5	18.5	19		Good Dil Development	Vacuum Chaff Box
						72		
				Accumulated Time Totals				

Accumulated Time Totals

Note - The green weight IN minus roasted weight OUT
Divided by green weight IN = percentage of weight loss.
Example: 15 lbs IN minus 12.75 lbs OUT = 2.25 lbs ÷ 15 = 15% weight loss.

Figure 3 TABLE A - DIEDRICH ROASTING & CLEANING LOG

8.0 ROASTING AND CLEANING LOG - See Figure 3, Table A

8.6 Cleaning and Servicing (continued)

THE SERVICING OF THE ROASTER IS EXTREMELY IMPORTANT. THE ROASTING AND CLEANING LOG WILL INDICATE ABOUT WHEN AND HOW OFTEN THE MACHINE NEEDS TO BE SERVICED. DO NOT TAKE THE SIGNIFICANCE OF THE ROASTING AND CLEANING LOG LIGHTLY!

Date	Type of Coffee	Green Wt. IN (Lbs.)	Roasted Wt. OUT (Lbs.)	Percentage Weight Loss (see note)	Roasting Time (Minutes)	Time Totals	Comments	Cleaning & Service Schedule
					Accumulated Time Totals			
					Accumulated Time Totals			

Note - The green weight IN minus roasted weight OUT
divided by green weight IN = percentage of weight loss.
Example: 15 lbs IN minus 12.75 lbs OUT = 2.25 lbs ÷ 15 = 15% weight loss.

TABLE B - DIEDRICH ROASTING & CLEANING LOG

9.0 CLEANING

9.1 General: Keeping your Roaster and its exhaust ducting clean, from inside the Roaster to its termination outside the building, is of utmost importance. Failure to do so will create a ***SEVERE FIRE HAZARD.***

A good cleaning schedule requires approximately 15 minutes of cleaning for every four (4) hours of roasting between the major 30 hour cleaning cycles, which should take approximately one (1) hour to thoroughly clean the roaster from top to bottom.

Accumulated chaff and oil residues are extremely flammable. Poor air flows can result in a build-up of flammable gases in the Roaster as well as the exhaust ducting.

It is vitally important that all qualified operators of the Roaster understand that ***A DIRTY AIR FLOW SYSTEM INCREASES THE RISK OF A FIRE!***

Any restriction of air flow anywhere in the system (including exhaust ducting) will create a "snowball" effect of residue/creosote build-up in all air flow passages. This build-up directly affects the performance and efficiency of the Roaster. To prevent excessive residue build-up, the air flow system requires periodic cleaning.

Establish a Cleaning Schedule that is proportional to the amount of coffee roasted, taking into consideration the type of coffee and the degree of roast, as well as the climatic conditions.

Most of this information can be obtained from the data gathered in the Roasting and Cleaning Log, Table A.

The seasonal climate of the region in which the Roaster is used will greatly affect the amount of cleaning required.

A moist, humid climate requires more frequent cleaning of the Roaster than a hot, dry climate. A moist, cold climate creates severe condensation as will those coffees with excessive moisture. This condensation and moisture will adhere to the Roaster's internal components and exhaust duct.

9.0 CLEANING

9.1 General: (continued)

The types of coffees and degree of roast will also influence the amount of cleaning required. Some geographic regions, more than others, are known for their dark roasted coffees. The darker the roast, the more the oils come to the surface of the bean, which in turn contributes to oil in the exhaust smoke. The oily smoke adheres to all surfaces with which it comes in contact. Thus, if more coffee is roasted dark rather than light, more frequent cleaning is required.

Natural or unwashed coffees (i.e. Indonesians) have much more chaff on the bean than washed coffees (i.e., Central and South American). Thus, if more unwashed coffees are roasted than washed coffees, the chaff box, burner tray and cooling bin require more frequent cleaning.

Decaf coffee has almost no chaff on the exterior of the bean so if a fair quantity of decaf is roasted light, the chaff box will require very little cleaning. Decafs are usually roasted dark and oily so duct cleaning will require more attention.

In reading this, you will understand why the Roasting and Cleaning Log (see Table A) is most important.

9.2 Daily Basis: About 15 minutes should be spent cleaning the roaster inside and out and checking for residue build-ups after every four (4) hours of roasting. After every four hours of roasting, remove the chaff from the lower compartments in the Floor Mount model or the cyclone on the Tabletop model.

Immediately after shutting the roaster down, clean and remove the chaff from the lower compartment or cyclone to reduce potential fire hazard.

9.3 After Every 12 Hours: of continuous roasting, remove the chaff and broken beans from the drum chaff tray located directly under the roasting drum. The three thumb screws on either side access this tray.

9.4 Every Two Weeks: or less, clean below the cooling bin to retain cooling efficiency.

To maintain sanitary standards and general appearance, clean and polish the outside surfaces of the Roaster on a regular basis.

9.0 CLEANING

9.5 After 30 Hours of Roasting: or once a month, do a thorough cleaning of all compartments. Do a service check of all components in the Roaster including the blower impeller, the back ducting system, and all air flow passages including the ducting from the Roaster to the exterior of the building.

9.6 LOWER COMPARTMENTS

This compartment replaces the chaff collection cyclone mounted on the tabletop model. This compartment is designed to separate the chaff from the exhaust air flow. It must be cleaned out every 3-4 hours of roasting **and before leaving Roaster at the end of day's roasting.**

The compartment is accessible by door mounted on the lower right side of the machine.

Before removing the chaff, inspect for smoldering chaff. Extinguish with a water spray bottle. Use a vacuum cleaner and a putty knife to remove **COOLED** chaff from compartments. Thoroughly clean compartment areas and corners as well as the inside surfaces of the access doors and panels.

9.7 DRUM CHAFF TRAY

Clean out broken beans and chaff collected from the roasting drum tray daily. The tray is located directly under the drum and burners. Access is through burner access panels on each side of the Roaster, above control panel. These panels are fastened with three thumb screws each. Keep clean by vacuuming or sweeping chaff before its build-up exceeds a depth of 1/2-inch. Use care in cleaning around pilot gas lines and electrode leads. A bent gas line can hamper burner safety.

9.8 COOLING BIN

For cooling efficiency and to minimize a fire hazard, the area below the screen must be cleaned on a regular basis.

To clean below the cooling bin, simply pull up on the agitator to remove it from the cooler. Then, the cooler simply lifts out allowing full access for cleaning.

9.0 CLEANING

9.8 COOLING BIN (continued)

When chaff and oil build-up below the screen becomes excessive, chaff will pass through the exhaust ducting. To clean the cooling bin, use a vacuum cleaner (with air flow reversed) to blow debris through the screen. Use a wire brush to dislodge debris from the screen. Clean agitator assembly's wire brushes.

To remove cooling bin:

a. Lift agitator assembly from gear box drive shaft. Lift out cooling bin.

b. To reassemble, simply reverse order.

9.9 BLOWER FAN

The blower fan on the Tabletop model is mounted directly on top of the cyclone. The Floor Mount model has the fan mounted in the rear bottom compartment. The lower back cover of the Floor Mount model must be removed to access the blower motor.

To remove the fan:

a. Disconnect the power source to the roaster.

b. Disconnect the yellow cord from the motor by loosening the black nut on the cord and then unplugging the cord from the motor. This procedure is the same for both models.

c. Remove the three mounting bolts from the blower base. At this point, the motor can be removed from the roaster.

d. To remove the fan blade from the blower motor assembly, loosen the small set screw in the hub of the fan blade. Pull the fan blade out and soak in water.

e. Reinstall the fan and the motor assembly by reversing the removal procedure.

9.0 CLEANING (continued)

9.10 INTERNAL DUCTING

The cleanliness of the internal duct system is vital to the proper air flows needed for optimum roasting conditions and efficient cooling of the roasted coffee. Residue build-ups in any section of this duct work impedes the proper operation of the roaster.

The internal ducting is located at the back of the machine. The same back covers described in the blower fan section must be removed to access this ducting. On the Tabletop model, it is one cover mounted with three thumb screws. On the Floor Mount model, it is the same top cover plus the lower cover held in place with four additional screws that must all be removed to open up the top and the bottom of the roaster.

Remove all clamps connecting duct sections and remove complete system. Cleaning is most effectively done with a wire brush.

9.11 ROASTER EXHAUST DUCTING

The cleaning of the exhaust ducting must be done by a professional chimney sweep or company experienced in cleaning industrial or restaurant equipment that is subject to heavy tar and/or oily build-up. Make sure that they are properly licensed and bonded. Improper cleaning can result in a fire.

Every **month**, check the ducting from the Roaster to the outside of the building for residue build-up. If residue thickness exceeds 1/8-inch build-up in the elbows or the exhaust cap on the roof, the ducting must be cleaned.

Even if residue build-ups do not exceed 1/8-inch per year, clean system annually, otherwise accumulated residue will become baked on surfaces making it impossible to clean.

Excessive build-up of residue will have an adverse effect on the air flow through the Roaster as well as the efficient performance of the Roaster. The exhaust cap, elbows or Y-fittings tend to collect residue faster than the straight exhaust sections, thus requiring more frequent cleaning.

9.0 CLEANING

9.11 ROASTER EXHAUST DUCTING (continued)

Coffee residue is extremely flammable, so proper cleaning is of the utmost importance. ***Always keep in mind: If you do not have a combustible, you will not have a fire! Fire prevention cannot be stressed enough!!***

9.12 GENERAL CLEANING

If your Roaster has a brass face plate, it can be polished with any brass polish. Outside painted surfaces can be cleaned with a mirror glaze (Meguiar's Mirror Glaze is recommended and available at most paint stores and Plexiglas shops). Use of a mirror glaze (rather than a wax-based cleaner), prevents the paint from becoming hazy, a result of roasting heat to the paint. The viewing windows, chute and the agitator assembly (in cooling bin) are easier to clean while they are still warm from roasting heat.

This completes the Roaster cleaning procedure.

10.0 MAINTENANCE

CAUTION: ALWAYS DISCONNECT ROASTER AT ELECTRICAL SOURCE (at circuit breaker or safety shut-off switch) BEFORE SERVICING MOTORS OR MOVING COMPONENTS.

10.1 Suggested hand tools (one each) to be available for cleaning and maintenance:

TOOLS REQUIRED

Combination wrenches
5/16, 3/8, 7/16, 1/2, 9/16, 5/8
Allen Wrench Set
Fire Extinguishers,
Dry chemical or carbon dioxide, two or more
Water Hose
Phillips 3-inch screwdriver #2
Slotted screwdriver, 3-inch
Nut driver, 5/16-inch
Grease gun (cartridge type)
Wire brush
Small spray bottle
Putty knife (flexible)
Kitchen knife
Vacuum cleaner (reversible air flow

LUBRICANTS REQUIRED

USDA H1 rated High Temperature Food Grade Grease (**AVAILABLE ONLY FROM DIEDRICH COFFEE ROASTERS**)
SAE20 non-detergent oil or sewing machine oil
Wd-40 spray lubricant

10.0 MAINTENANCE (continued)

10.2 ROASTING DRUM DRIVE CHAIN

Oil every six months with SAE20 non-detergent or sewing machine oil. For access, remove the top back cover. Apply 4-5 drops of oil to chain at various intervals. Do not over lubricate.

WARNING: KEEP FINGERS, HAIR AND LOOSE CLOTHING CLEAR OF MOVING CHAIN AND SPROCKETS.

While chain is still accessible, check chain adjustment. Correct chain adjustment is achieved when there is 3/4 to 1-inch of slack in the chain loop when squeezed together mid way between the two sprockets.

10.3 FRONT AND REAR DRUM BEARINGS

Bearings should be lubricated every 60 operating hours, **NOT** roasting time. Operating time is the time the Roaster is turned ON until it is turned OFF. Use only H1 High Temperature Food Grade Grease. Hardware store or automotive types of grease can be toxic and are not to be used in the proximity of food products. Roaster must be at roasting temperatures (without beans in drum). Lubrication is best done upon finishing the day's roasting while the Roaster is still hot at 450 degrees Fahrenheit (232 degrees Celsius).

Front bearing is exposed. Bring operating temperature to approximately 450 degrees Fahrenheit (232 degrees Celsius). With drum rotating, use grease gun to inject 2-3 pumps of grease in bearing fitting.

Before lubricating the rear bearing **STOP THE DRUM FROM ROTATING.** Access to bearing requires opening of small hinged panel on upper cover plate. Insert grease gun fitting **WITH BOTH HANDS CLEAR OF CHAIN AND SPROCKET.** Again, start the drum to rotate. Again inject 2-3 pumps of grease into bearing fitting. **STOP THE DRUM FROM ROTATING.** Remove grease gun and wipe off excess grease.

WARNING: KEEP FINGERS, HAIR AND LOOSE CLOTHING CLEAR OF MOVING CHAIN AND SPROCKETS.

10.0 MAINTENANCE (continued)

10.4 AGITATOR DRIVE SHAFT UNIVERSAL JOINT

To access the universal joint, remove the agitator assembly from the cooler and remove the cooler from the roaster. Lubricate drive shaft universal joint every six months. Use the same grease that is used on the drum bearings to lubricate the agitator universal. Afterward, wipe universal clean.

10.5 AGITATOR BRUSH ASSEMBLY ADJUSTMENT

To adjust, loosen set screws in the agitator arm. Push brush down until brush bristles slightly touch the cooling bin screen. Tighten set screws - do not over tighten.

10.6 AIR CONTROL HANDLE

Lubricate every six months with High Temperature grease.

This completes the maintenance instructions.

11.0 FIRE CONTROL - ACTION TO TAKE - READ CAREFULLY AND REVIEW REGULARLY.

11.1 ROASTING DRUM FIRE

a. At control panel: Move blower switch to OFF.
b. Turn the gas shut-off valve on the gas supply line to OFF.
c. Open chaff collection system and soak chaff with water.
d. Determine whether fire has reached the blower.
e. If not, proceed with controlling fire in the drum.

If the fire has reached the fan area, quickly cycle fan motor ON. As the fan blade slows down, discharge fire extinguisher into fan area.

DO NOT DUMP BURNING COFFEE INTO THE COOLING BIN.

If the scorched coffee beans are discharged into the cooling bin, they are exposed to oxygen and will flash into flames. The metals in the cooling bin are not designed to handle the high temperatures generated by burning coffee beans.

EXTINGUISH FIRE by squirting water as required through the port provided for the sample trowel on the front panel.

Turning off the blower motor stops the air flow and automatically turns off the gas flow to the burners.

11.2 CHAFF COLLECTION SYSTEM FIRE

a. At control panel: Move blower switch to OFF.
b. Turn the gas shut-off valve on the gas supply line to OFF.
c. Open compartment doors and soak chaff with water.
d. Determine if the fire has reached the fan.

If the fire has reached the fan area, quickly cycle fan motor ON. As the fan blade slows down, discharge fire extinguisher into fan area.

11.3 EXHAUST DUCT FIRE

If the fire has reached the fan area, quickly cycle fan motor ON. As the fan blade slows down, discharge fire extinguisher into fan area.

11.0 FIRE CONTROL - ACTION TO TAKE - READ CAREFULLY AND REVIEW REGULARLY.

11.3 EXHAUST DUCT FIRE (continued)

This action blows extinguisher agent into exhaust duct.

11.4 DRUM CHAFF TRAY FIRE

a. At control panel: Move blower switch to OFF.
b. Turn the gas shut-off valve on the gas supply line to OFF.
c. Open either side panel and spray with water.

11.5 Dial 911 or Fire Department on the telephone if fire is not quickly extinguished. **DO NOT PANIC** - panic contributes to situation getting out of control.

Note: At regular intervals, PRACTICE these above fire control measures.

Date	Type of Coffee	Green Wt. IN (Lbs.)	Roasted Wt. OUT (Lbs.)	Percentage Weight Loss (see note)	Roasting Time (Minutes)	Time Totals	Comments	Cleaning & Service Schedule
					Accumulated Time Totals			
					Accumulated Time Totals			

Note - The green weight IN minus roasted weight OUT
divided by green weight IN = percentage of weight loss.
Example: 15 lbs IN minus 12.75 lbs OUT = 2.25 lbs ÷ 15 = 15% weight loss.

TABLE B - DIEDRICH ROASTING & CLEANING LOG

Date	Type of Coffee	Green Wt. IN (Lbs.)	Roasted Wt. OUT (Lbs.)	Percentage Weight Loss (see note)	Roasting Time (Minutes)	Time Totals	Comments	Cleaning & Service Schedule
					Accumulated Time Totals			
					Accumulated Time Totals			

Note - The green weight IN minus roasted weight OUT
divided by green weight IN = percentage of weight loss.
Example: 15 lbs IN minus 12.75 lbs OUT = 2.25 lbs ÷ 15 = 15% weight loss.

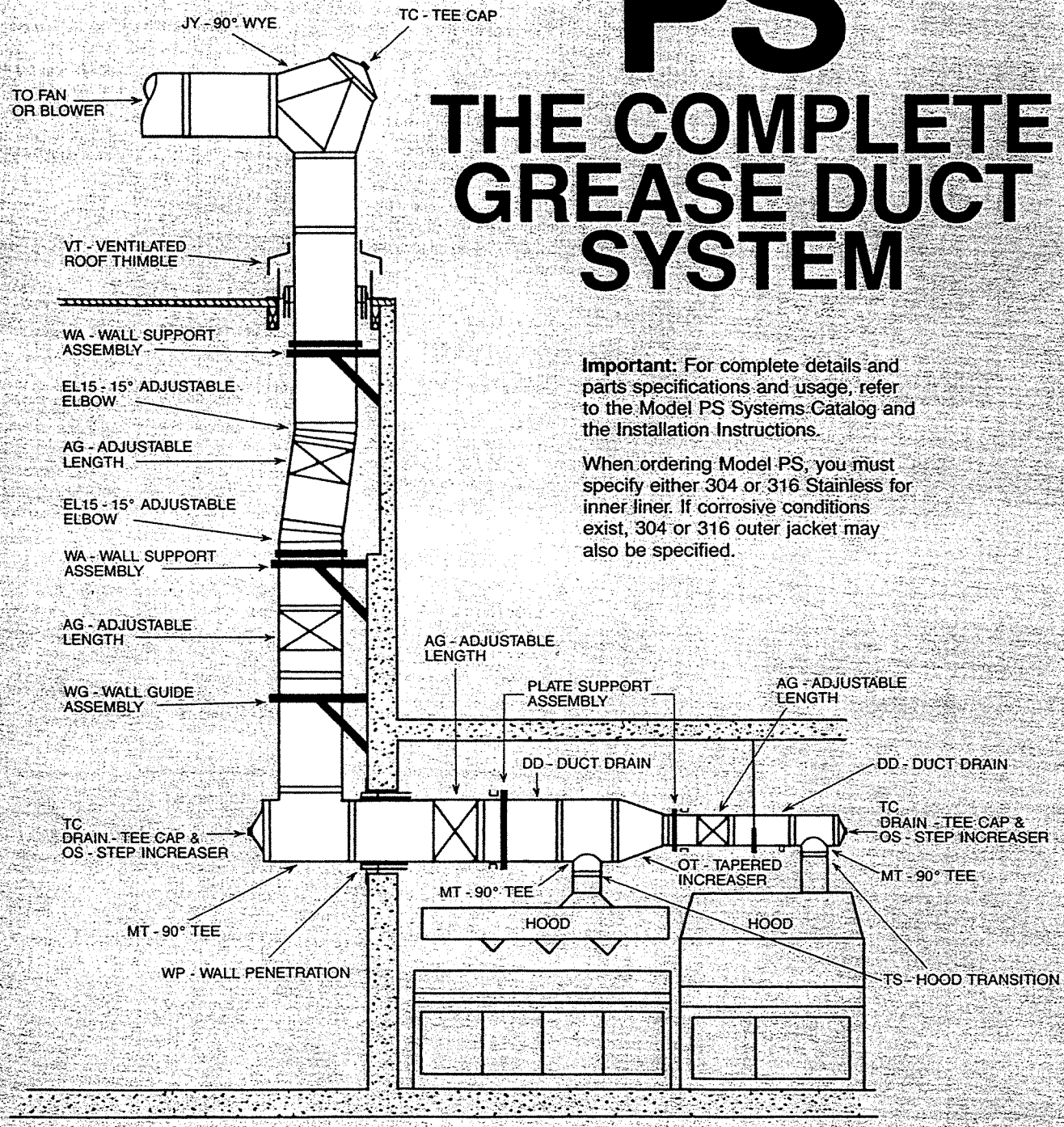
TABLE B - DIEDRICH ROASTING & CLEANING LOG

MODEL PS

THE COMPLETE GREASE DUCT SYSTEM

FIG. 1 — Model PS Grease Duct

This diagram is to illustrate the wide variety of parts available and it is not meant to be a typical installation.



Important: For complete details and parts specifications and usage, refer to the Model PS Systems Catalog and the Installation Instructions.

When ordering Model PS, you must specify either 304 or 316 Stainless for inner liner. If corrosive conditions exist, 304 or 316 outer jacket may also be specified.

ITEM	PART NUMBER	
DOUBLE WALL PIPE		
42" LENGTH	P-42	
30" LENGTH	P-30	
18" LENGTH	P18	
ADJUSTABLE PIPE		
30" LENGTH	P-AG30	
18" LENGTH	P-AG18	
VARIABLE LENGTH	P-VL	NOT FOR THERMAL EXP.
DOUBLE WALL FITTINGS		
TEE, 90°	P-MT	
TEE, 45° LATERAL	P-JL	
WYE	P-JY	
DRAIN TEE CAP	P-TC	
INCREASER TAPERED	P-OT	
INCREASER STEPPED	P-OS	
15° ADJUSTABLE ELBOW	P-EL15	
30° FIXED ELBOW	P-EL30	
45° FIXED ELBOW	P-EL45	
GREASE DUCT FITTINGS		
HOOD TRANSITION	P-TS	
DUCT DRAIN	P-DD	
NOZZLE SECTION	P-FN	
DRAIN BUCKET	P-DB	
BELLOWS PARTS		
BELLOWS JOINT (LINED)	P-BJ	NOT UL LISTED
BELLOWS JOINT (UNLINED)	P-BJU	NOT UL LISTED
FLANGE ADAPTER	P-FD	
TERMINATIONS		
DRAIN SECTION	P-DS	
EXIT CONE	P-EC	
CLOSURE RING	P-CR	
STACK CAP	P-SK	
HALF CHANNEL BAND	P-HCB	
ROOF & WALL PENETRATIONS		
STORM COLLAR	P-SC	
TALL FLASHING	P-TF	
WALL PENETRATIONS	P-WP	
VENTILATED THIMBLE	P-VT	
ROOF SUPPORT ASSEMBLY	P-RS	
STRUCTURAL ACCESSORIES		
BOILER KIT	P-BK	
CLAMP FLANGE	P-CF	
ANGLE RING, HALF	P-HR	
ANGLE RING, FULL	P-FR	
PLATE SUPPORT ASSEMBLY	P-PA	
WALL SUPPORT ASSEMBLY	P-WA	
WALL GUIDE ASSEMBLY	P-WG	
FLOOR GUIDE ASSEMBLY	P-FG	
MISCELLANEOUS		
GUY SECTION	P-GS	
GUY TENSIONER	P-GT	NOT UL LISTED
FLIP TOP	P-FL	NOT UL LISTED
SEALANTS		
RTV SILICONE	P-600 TUBE	
CERAMIC JOINT CEMENT	P-1400 KIT	
CERAMIC JOINT CEMENT	P-2000 KIT	

PART NUMBERS:

Model PS components are identified by individual part names and part numbers. Each part carries an Internal Diameter size prefix, the letter "P" designating Model PS, and the letter code identification. Also, parts that are available in set standard lengths show the part length (in inches) at the end of the part number. Example: The part number for a six inch I.D. Model PS Adjustable Length that is 30 inches long is:

Pipe I.D. Size (In.)	Model PS Code	Part Code	Part Length (In.)
↓	↓	↓	↓
6	**P-**	**AG**	**30**

When ordering Model PS Systems, it is essential to use the proper identification for each part required.

Why Use Model PS Grease Duct

Laboratory tests show that temperatures in a grease duct fire can quickly reach 2000°F. Comparative tests of PS versus single wall duct show enormous safety differences. PS provides a level of safety at its approved clearances which cannot be obtained by single wall duct at any reasonable clearance to combustible surroundings. At duct gas temperatures of 2000°F, 10 inch size single wall duct quickly causes charring and smoking of wood at 18 inch clearance due to strong heat radiation. The insulating air space and low heat radiation of the aluminized steel outer of PS allow clearances as low as 5 inches without heating combustibles above allowable limits. All PS clearances from 5 to 18 inches have been verified by thorough safety testing with 2000°F in the duct for a 30 minute duration.

Model PS Grease Duct Is Safety Tested for Reduced Clearances

The Selkirk Metalbestos Model PS Grease Duct is a factory built, pressure tight system for safe operation at temperatures of up to 2000°F with the following clearances to combustibles:

Pipe ID	Clearance
6, 8, 10"	5"
12"	6"
14"	7"
16"	8"
18"	9"
20"	10"
Over 20"	18"

By the selection of proper prefabricated parts, it is possible to design and install a system with a minimum of personnel without on-the-job welding or special handling equipment.

Grease Duct Application

Selkirk Metalbestos Model PS Grease Duct Systems are suitable for use in commercial, industrial, institutional or other similar installations requiring exhaust system components for the removal of smoke and grease-laden vapors. Model PS Grease Ducts are intended as complete systems connecting the hood or grease extractor system to the outdoors through exhauster or blower equipment.

A distinct advantage of the Model PS Grease Duct is the Duct Drain and Drain Bucket System which allows removal of hot grease during cooking and easy, frequent cleaning to help keep the duct safe from fire hazard.

Round Model PS Grease Duct provides for more efficient air flow than conventional rectangular ducting and structural integrity is achieved using lighter-gauge material and fewer reinforcing members. Model PS is completely integrated for efficient, mechanical design and provides a clean appearance on final assembly.

UL Listed

Model PS Grease Duct System has been fully tested by Underwriters' Laboratories, Inc. under their file number MH11382 and is listed in UL Category YYGQ. ULC File Number is CR1414.

UL testing proved conclusively that Model PS has an acceptable thermal performance as a Grease Duct System; that the joint design with the Ceramic Joint Cement is sound and does not allow any grease leakage; and that system joints in tension and impact strength conform to acceptable standards equaling those of other traditional Grease Duct materials.

All Model PS parts suitable for Grease Ducts in the various sizes to 36" Internal Diameter are so identified and carry the UL Listing mark.

Size 42" I.D. and 48" I.D. are available, but are not UL Listed.

Conforms to NFPA Standards

Selkirk Metalbestos Model PS Grease Duct System is intended to be installed and used in accordance with National Fire Protection Association Standard #96 titled, "Standards for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment."

In addition, the International Conference of Building Officials (ICBO) has published their Research Report #3964 relative to the performance of the Model PS Grease Duct.

Detailed instructions for installation of the Model PS System so that it conforms to standard are provided by Selkirk Metalbestos.

System size and capacity information can be obtained from Chapter 31, 1984 ASHRAE Handbook, Fundamentals Volume, or Chapter 3, Air Pollution Engineering Manual of the U.S. Environmental Protection Agency, 1973.

Refer to Selkirk Metalbestos Model PS Systems Catalog and Model PS Grease Duct Installation Instructions for additional application, assembly and parts descriptions and specifications.

Component Parts for Model PS System

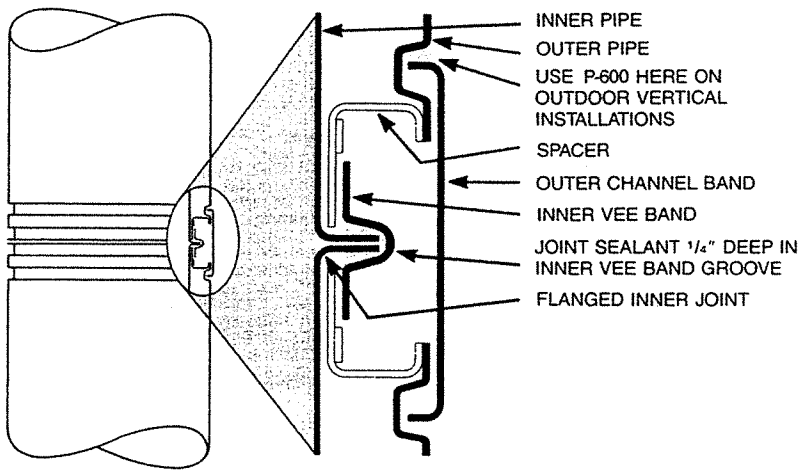
The Model PS Piping System is composed of a series of interconnecting, factory-built, stainless steel components which include Insulated Pipe, Insulated Fittings, Insulated Elbows, Terminations, Supports and Accessories in a variety of sizes to 48″ Internal Diameter.

The double wall pipe has an outer jacket of aluminum-coated steel 0.025″ thick in 6″-24″ sizes and 0.034″ thick for 28″-36″ sizes. There is a minimum 1″ air space between the walls. The inner gas-carrying pipe is Type 304 stainless steel 0.035″ minimum thickness up to 36″ I.D., 0.048″ minimum thickness for 42″ and 48″ I.D.

The nominal weight of the pipe per foot of height equals 0.90 times the size. Thus 36″ weighs 32.4 pounds per foot. Make certain that the Model PS Grease Duct is properly supported, that component parts are not overloaded and that proper auxiliary structural members are used.

FIG. 2 — Assembled Joint, Model PS Grease Duct

NOTE: (1): For outdoor installation with the Grease Duct vertical apply a bead of silicone sealer in the groove at the upper edge of the Channel Band and at the overlap at its end.



Pipe and Fitting Joint Assembly

All Model PS Grease Duct joints are sealed liquid tight with a special ceramic mortar placed in Inner Vee Bands at the time of installation.

By following Installation Instructions carefully, the duct assembly can be completed quickly and easily by a small work crew with no special tools or welding required.

Recommended Enclosures and Surroundings

Selkirk Metalbestos Grease Ducts are primarily intended to be used in noncombustible surroundings and installed unenclosed. With interior installation in a building more than one story in height, the ducts must be housed in a continuous enclosure to maintain fire resistance and separations required by building code authorities.

Where the PS ducting is not installed in an open room, and a full enclosure is needed at minimum clearance, the enclosure must be noncombustible and fire rated. This is to conform to applicable national and local building codes.

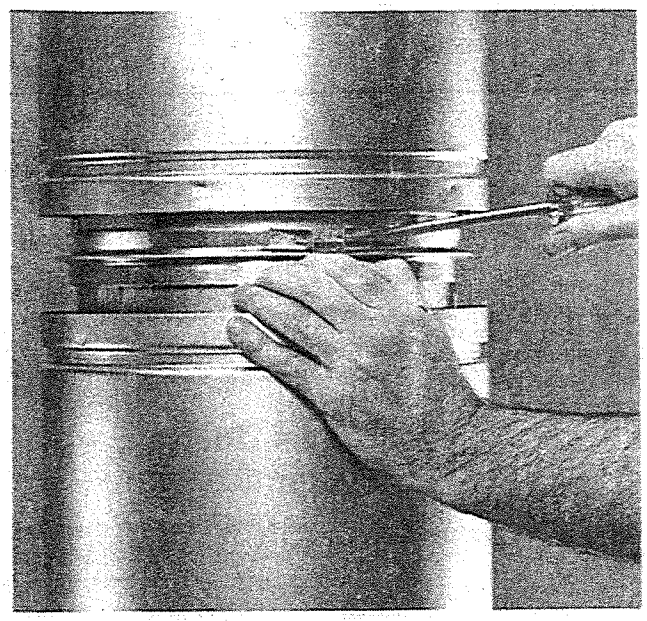
Model PS may be extended through any story of a building provided walls have the proper fire resistance rating. Roof Support Assembly and Ventilated Roof Thimble and Wall Penetration Assembly parts are provided for passage through combustible construction.

Grease Duct System Design

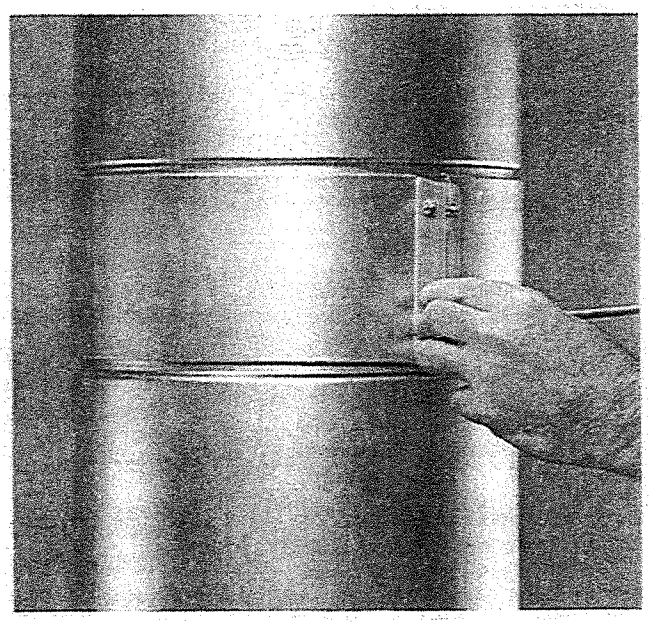
The inherent design features of the Model PS Grease Duct make it ideally suited to accomplish its main function of conveying grease-laden air out of the kitchen area to the outdoors where it will not cause discomfort to people or damage the kitchen facility. Even though the Grease Duct must be safely integrated with other equipment such as hoods, grease extractors and exhaust fans, its basic safety features must be fully utilized to successfully design an efficient exhaust system. The Model PS Grease Duct System has a special group of parts which are specifically designed to create a safe and reliable system.

Fill inside groove of Inner Vee Band with P-2000 Ceramic Joint Cement. Inner Vee Band for 6", 8", 42" and 48" sizes is two piece part.

Position Inner Vee Band below flange of one Model PS pipe length or fitting.



Mate flanges of two pipes together, position Inner Vee Band over two flanges and tighten securely.



Position Outer Channel Band around outer casing. Align with pipe grooves and tighten.

These special parts are the Grease Tight Adjustable Length (P-AG), the Duct Drain (P-DD), the Nozzle Section (P-FN), and the Drain Bucket (P-DB). Cleanouts to aid in the inspection and maintenance of the duct system are assembled with a 90° Tee, the Stepped Increaser (P-OS) and the Tee Cap (P-TC).

Adjustable Length (P-AG)

The Adjustable Length has two major functions: To make up odd lengths of pipe as needed in short runs, and in addition to serve as an expansion joint for thermal expansion in longer runs of pipe (See Fig. 3). The Adjustable Length comprises a sliding inner section flanged on one end only. This sliding piece is sized to fit closely inside a standard pipe section. At the sliding joint, the assembly as shipped is fitted with a special high temperature graphited packing seal. The sliding outer jacket is aluminized steel of the same thickness as that used on piping outer

FIG. 3 — Adjustable length (Part No. P-AG)

*NOTE: Inners should overlap D/2 where used as expansion joint. Do not install without adequate allowance for expansion.

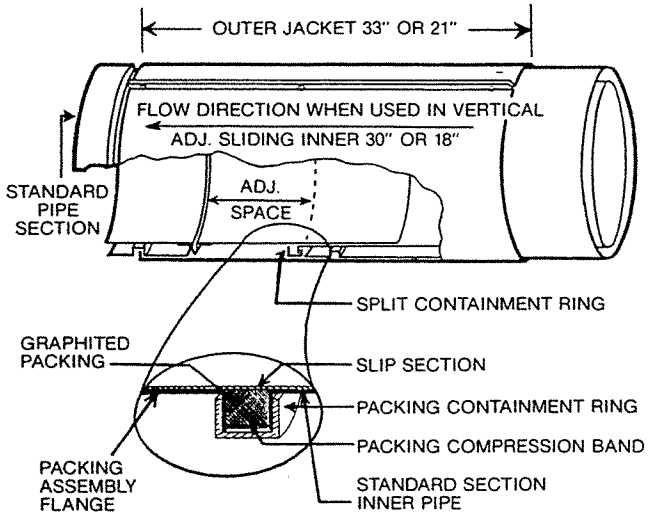


FIG. 4 — Duct Drain Section (Part No. P-DD)

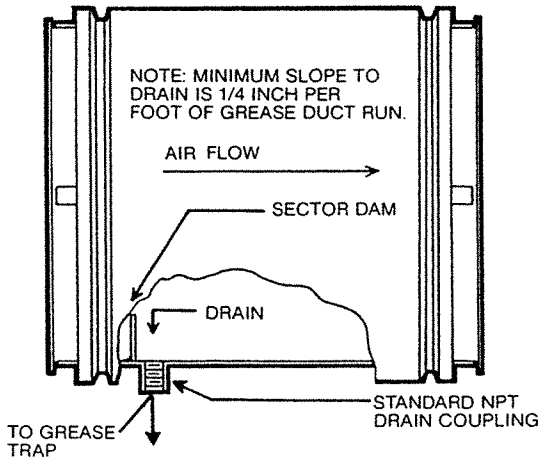


FIG. 5 — Model PS Drain Bucket (Part No. P-DB)

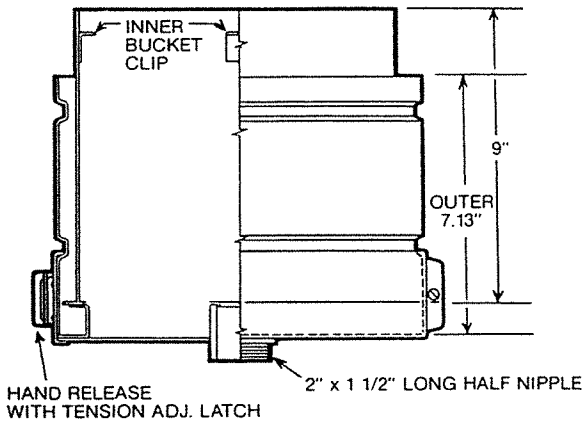
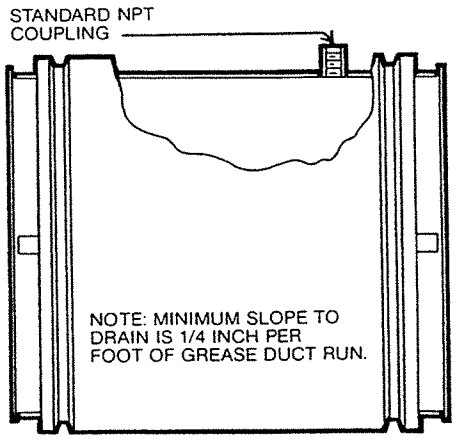
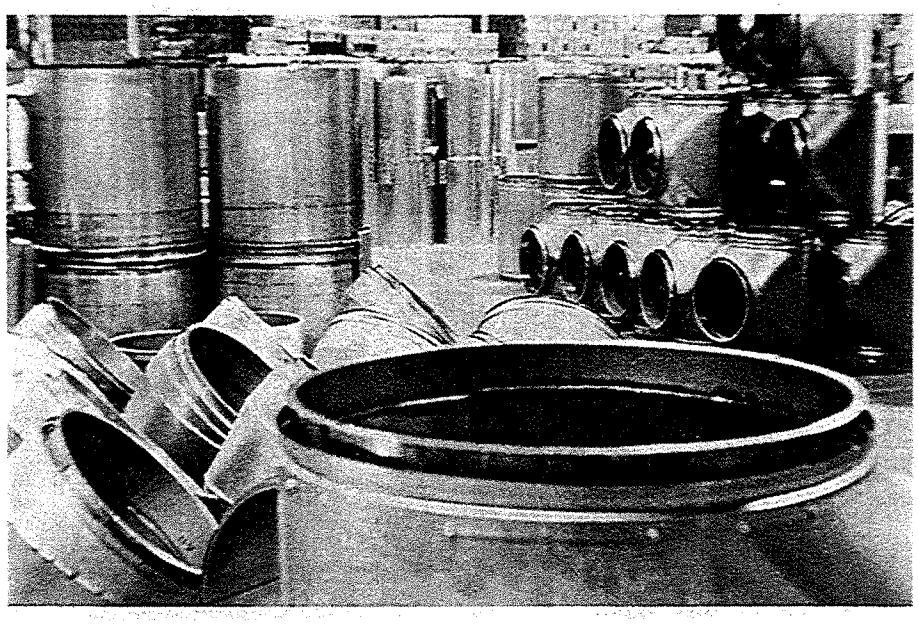


FIG. 6 — Nozzle Section (Part No. P-FN)





Model PS Grease Duct pipe and fittings in plant inventory.

casings. It is placed around the sliding inner joint and must also slide in order to avoid expansion stresses. A properly installed Model PS Grease Duct has the characteristics of a continuous pipe of 300 Series Stainless Steel and it will expand and contract along its entire length with changes in its temperature. Correctly installed Angle Rings, Wall Guides, and Floor Guides keep the chimney aligned, provide for adequate resistance to lateral loads and allow for free axial expansion and contraction movement.

Duct Drains (P-DD)

Duct Drains have two distinguishing features (See Fig. 4). The first is a duct drain coupling which is located adjacent to the second distinctive feature, which is a grease dam. When the grease duct is correctly installed with a minimum slope to the drain of 1/4 inch per foot of run, "puddling" of grease or residues will not occur at sites other than at the drain couplings because of the functional location of the dams. The cleaning and maintenance procedures are simplified considerably due to those functional characteristics because the materials in the duct can easily be drained to the outside grease traps for proper disposal.

Nozzle Section (P-FN)

The use of the Nozzle Section allows various types of fire suppression equipment to be integrated into the grease ductwork. Some of the various types are: 1) CO_2 extinguishing systems (NFPA 12-1977), 2) Sprinkler systems (NFPA 13-1978), 3) Foam-Water Sprinkler/Spray system (NFPA 16-1974), and 4) Dry Chemical Extinguishing system (NFPA 17-1975).

The Nozzle Section is the same basic construction as the Duct Drain with the sector dam removed (See Fig. 6). Without the dam, the Nozzle Section can be positioned so that the nozzle fitting is either on the sides or top of the section consistent with good fire protection design practice. Standard NPT Couplings allow for flexibility when making the required connections.

An automatic hot water/detergent injection system can be integrated into the PS Grease Duct System by using the dual purpose Nozzle Section and Tee's with Drain Buckets. All of these related parts have standard NPT hardware so that conventional nozzles and piping can easily be attached.

Whether or not an automatic cleaning system is installed in the PS Grease Duct it is recommended that the drains be fitted with grease traps so that the grease that runs to the drains during normal operation can be collected in traps located and attached so that they can capture the grease and enclose it outside the main grease duct structure.

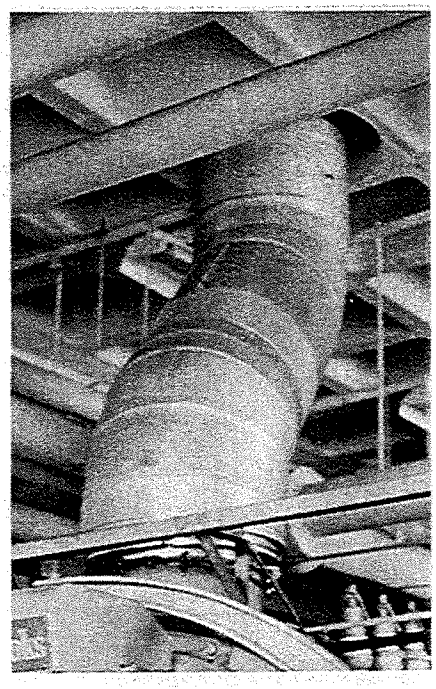
For an automatic cleaning system installation, the traps should be plumbed to the main sewer drains.

Drain Bucket (P-DB)

The Drain Bucket (P-DB) is used to drain residue from the Vertical Tee section and as a clean-out at duct directional changes. Accumulated grease melts into trap containers below the drain opening and should not burn because the grease in the trap no longer has access to combustion air (See Fig. 5).

U.S. Patent Rights

Selkirk Metalbestos Model PS Piping System is manufactured under one or more of the following U.S. Patents: 3902744, 4029343, 4029344.



Each Model PS Grease Duct System is custom designed and specially manufactured to individual job specs.

Selkirk Metalbestos representatives throughout North America are qualified to provide complimentary field service to assist contractors, builders, engineers and architects in designing Boiler Stacks and Breechings, Grease Ducts, Diesel and Turbine Exhausts, Marine Exhausts and Ducts, Freestanding Stack Systems, and Residential Chimney and Gas Vent Systems. Contact the Selkirk Metalbestos Regional Office nearest you for assistance.

Model PS has been approved by the New York City Board of Standards and Appeals under the following calendar numbers:

Boiler Stack	No. 310-79-SM
Grease Duct	No. 689-81-SM
Engine Exhaust	No. 177-82-SA

COMMERCIAL/ INDUSTRIAL PRODUCT SALES OFFICES

NORTHERN AREA
Mr. Craig Bennett
1210 Riverton Drive
Mukwonago, Wisconsin 53149
(414) 363-7748

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Aloha, Oregon 97006
(503) 649-6376

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MANUFACTURING PLANTS

P.O. Box 631
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Telex: 241380

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(208) 467-7411

PLANTS ALSO LOCATED IN:
Brockville, Ontario-Canada
Toronto, Ontario-Canada

RESEARCH AND DEVELOPMENT LABORATORIES

P.O. Box 510
Belmont, California 94002
(415) 593-3174

HOME OFFICE

P.O. Box 631
Logan, Ohio 43138
(614) 385-5671
Telex: 241380

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