

"The Difference is in the Detail"



DIEDRICH COFFEE ROASTER

OWNER'S MANUAL

**For Models IR-7, IR-12 and IR-24
(Standard)**

READ THIS MANUAL

**For important safety, installation,
operation and maintenance instructions.**

Keep this **manual with the **roaster** at all
times. Locate in a prominent place.**

Issued: February 1991

Reissued: August 2008

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PREFACE

This owner's manual covers installation, operation and maintenance as well as important safeguards of the Diedrich Coffee Roaster. The information described reflects the features found on current production models.

The Diedrich IR-7, IR-12, and IR-24 Coffee Roasters are all identical in construction detail and features offered. They differ only in scale so the descriptions provided in this Manual are generic and if differences exist, they will be specifically mentioned.

This manual covers all of the components which make up a coffee roaster. If you have any questions about the roaster, its accessories, or the proper use of them and they are not answered in this manual contact Diedrich Manufacturing, Inc.

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 Manufacturing, Inc. has found ways to meet them while maintaining the fundamental principles by which premium coffee is roasted for optimum cup quality.

The Diedrich IR Series Coffee Roasters feature a highly efficient gas-infrared heating system, which is combined with the non-perforated, carbon steel roasting drum to heat the coffee beans evenly and achieve optimum roasting standards.

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 manual carefully for important operation, maintenance and safety information.

This owners manual must be kept with the roaster at all times and be located in a prominent, easily accessible place. The contents of the manual, including the fire control instructions described in **Section 11 Fire Control** must be reviewed regularly by all operators of this roasting system.

All persons operating the Diedrich Coffee Roaster must be familiar with this manual and be properly trained in the safe and proper use of the roasting system. **The safe use of this equipment also requires an understanding of the basic chemistries that occur during the roasting process so that subtle warnings can be identified before critical problems arise.**

The roaster's internal compartments should be cleaned on a daily basis and more thoroughly cleaned after every 60 hours of use. More frequent cleaning may be required if chaff and residue build-up becomes excessive. Refer to Section 9.0 Cleaning for detailed instructions.

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!

A fire extinguisher should be located within easy reach of the roasting system. This should preferably be CO2 extinguisher with sufficient capacity for a roasting fire. Consult with your local fire marshal for recommendations on suitable fire extinguishers. You should also have water accessible near the roaster. If a water hose installation is not possible, a two-gallon water sprayer is recommended. If water is used, great care must be taken to keep the water away from the electrical system.

Never leave the roaster unattended while it is in operation...from start-up to shutdown. Leave the drum and blower motors running until the temperatures have dropped below 200 ° Fahrenheit (93 ° Celsius). Prior to leaving the roaster, perform all necessary post-roasting cleaning.

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. Keep clear of moving parts such as the drive chain at the rear of the roaster and the agitator arm and brushes in the cooling bin if so equipped. Injury can result from snagged, loose clothing, jewelry, hair or fingers.

Never permit an unqualified person to operate the roaster. A qualified operator will have thoroughly read this manual. All qualified operators must have a clear understanding of the proper and intended use of the equipment, roasting methods, cleaning requirements, fire suppression procedures and be aware of all safety precautions.

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

Keep the roasting area clear and free of combustible material.

Install a CO Monitor when roasting or storing roasted coffee in confined spaces due to the emission of carbon monoxide.

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 the lower half is usually very warm. The painted mantle encasing the roasting drum is warm to the touch during roasting. The cooling bin becomes hot when cooling freshly roasted beans.

FIRE CONTROL - Be sure to read and understand. PRACTICE!! Refer to Section 11.0

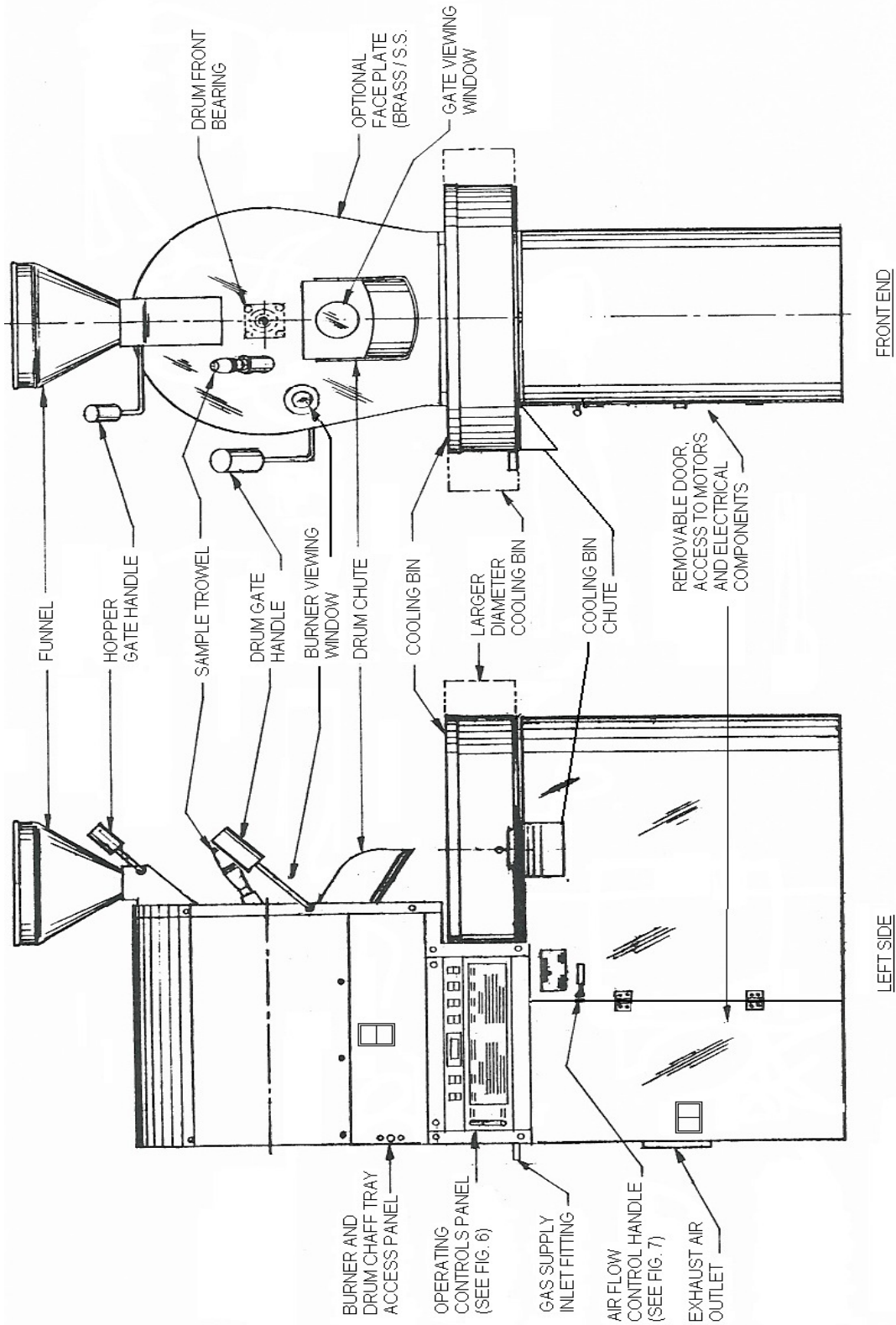


FIGURE 1 - ROASTER LEFT and FRONT END VIEWS

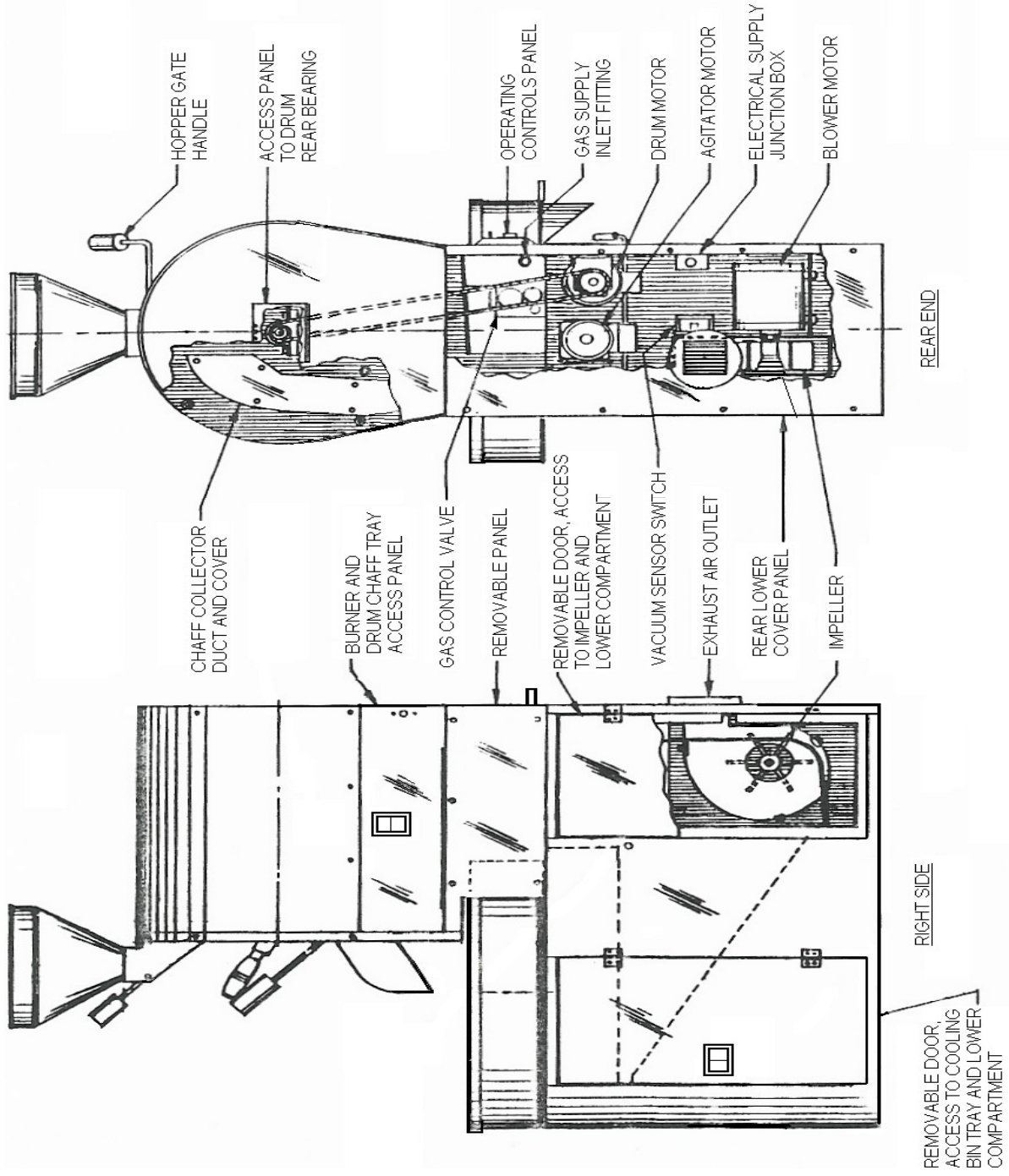


FIGURE 2 - ROASTER RIGHT SIDE and REAR END VIEWS

TABLE A -

IR Series Basic Specifications

Description	Unit of Measure	Model	Model	Model
		IR-7	IR-12	IR-24
Single Roast Range	lbs kg	1-15 .453 / 7	1-30 .453 / 12	1-52 .453 / 24
* Hourly Roast Output (maximum)	lbs kg	53.9 23	92.4 46	184.8 99
Roaster Weight Empty	lbs kg	880 400	960 436	1960 890
Floor Bearing Weight with maximum load of beans	lbs kg	895 406	990 446	2015 907
Floor Space Required	inches	26.5 x 50	29 x 58	38.5 x 64
includes exhaust air outlet	centimeters	67.3 x 127	73.7 x 147.3	97.8 x 162.6
Roaster Overall Height with funnel	inches centimeters	79 201	79 201	84.25 214
Roaster Overall Length with exhaust outlet	inches centimeters	42 107	42 106.6	61.75 156.94
Roaster Overall Width	inches centimeters	26.5 67.3	30.5 77.47	38.5 97.79
Gas Consumption	BTU/Hour	36,000	60,000	124,000
Gas Connection	Inches NPT	1/2	1/2	3/4
	MM NPT	13	13	19
Electric Supply	Volts AC - U.S.A. Volts AC - International	110-60Hz 220-50Hz	110-60Hz 220-50Hz	110-60Hz 220-50Hz
Amperage	110 V AC 220 V AC	9.8FLA 5FLA	9.8FLA 5FLA	26 FLA 22 FLA
Exhaust Duct Air Flow	Cubic Feet Minute (SCFM) Cubic Meters Second m3/hr	480 816	480 816	945 1606
Exhaust Duct Diameters	inches	6	6	8
*Based on maximum load every 16 minutes at 425 degrees F (218 degrees C) for 15% weight loss.	centimeters	15.24	15.24	20.32

Roaster Models - Dimensions			
Inches / Centimeters			
	IR-7	IR-12	IR-24
A: Chute Height	23.5" / 59.7	24.5" / 62.23cm	26" / 66.04cm
B: Bin Height	33.25" / 84.5	36.25" / 92.07cm	39" / 99.06cm
C: Overall Height	79" / 201cm	66.5" / 168.91cm	71.99" / 182.85cm
D: Funnel Height	10.5" / 26.67cm	10.5" / 26.67cm	12.25" / 31.11cm
E: Compartment Width	18" / 46 cm	18" / 45.72cm	24" / 60.96cm
F: Cooling Bin Diameter	26.75" / 69cm	29" / 73.66cm	38" / 96.52cm
G: Compartment Length	42" / 107cm	42" / 106.68cm	53.5" / 135.89cm
H: Overall Length	47.25" / 120.01cm	49.75" / 126.36cm	61.75" / 156.84

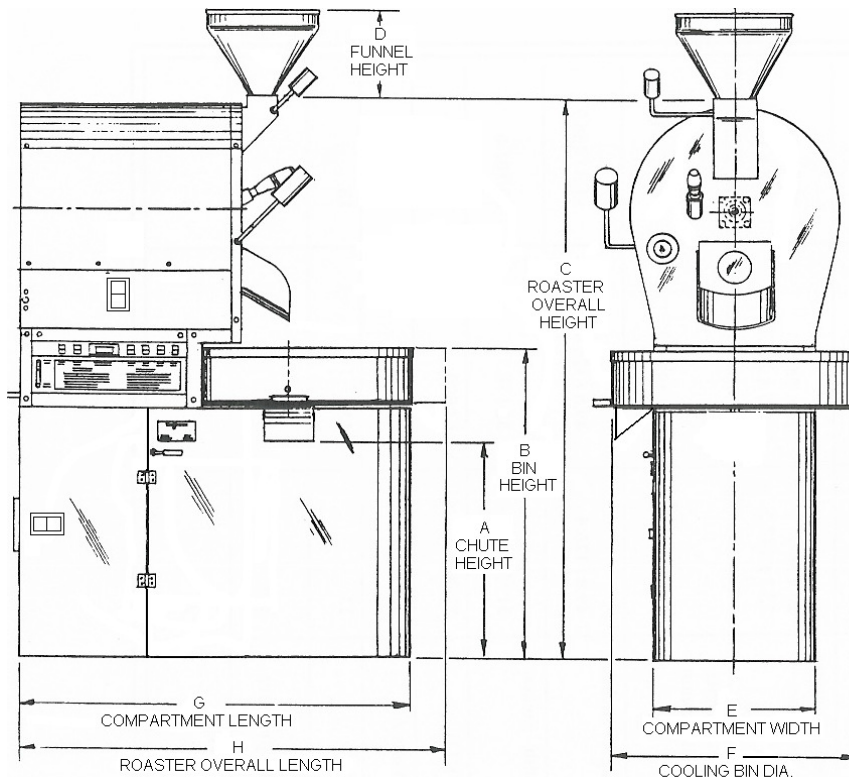


FIGURE 3 - ROASTER BASIC DIMENSIONS

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, ensure good performance and owner's warranty protection. We recommend that the local Building Department be contacted to obtain local codes and installation requirements.

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!

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.

When moving the uncrated roaster to its installation location and a narrow doorway hinders movement, detach and remove the cooling bin. To determine clearances refer to Figure 3 for cooling bin diameters. Refer to Paragraph 10.12 for disassembly and assembly instructions.

2.2 LEVELING

The roaster must be installed on a flat, non-combustible floor. A combustible floor requires a fireproof insulation on the floor areas occupied by the roaster. The floor must meet weight-bearing requirements of local codes for commercial buildings. Roaster gross weight with maximum load of coffee beans:

Model IR-7	895 lb / 406 kgs
Model IR-12.....	990 lb / 450 kgs
Model IR-24.....	2005 lb / 911.4 kgs

Careful leveling of the roaster is critical not only for performance but for alignment of the roasting drum. Use a carpenter's level.

For side-to-side leveling, set level crossways on top of the cooling bin. Shim roaster as required to level.

2.0 INSTALLATION INSTRUCTIONS (Continued)

2.2 LEVELING (continued)

For front-to-back leveling, set level lengthwise on top of cooling bin (at 90° from side-to-side leveling). Shim roaster as required to level. Non-combustible shims are required under the roaster.

2.3 PROXIMITY TO WALLS

Due to the extended daily use of the roaster, clearances to combustible or non-combustible walls or counters listed below must be followed to ensure 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 roaster to adjacent walls, counters or other appliances must be at least 18" (46 cm) or greater. No cabinets or storage areas are to be installed over the roaster or near the ducting.

2.3.2 Positive Pressure Grease Ducting clearances are defined by the manufacturer. Follow the manufacturer's specifications on minimum clearance from combustibles and non-combustibles.

2.3.3 Make sure all controls, access doors and removable panels on the roaster area are accessible and without restrictions.

2.4 GAS INSTALLATION - See Figures 4 & 14

Use a licensed contractor for the gas line installation.

Gas installation must conform to local, city, county, municipality, province, state, or national building codes, regulations, or laws. It is imperative that your licensed gas contractor is familiar with which building codes, regulations or laws apply.

The gas supply line must be sized to accommodate the total length of the run including bends. The volume of gas needed to function properly is determined by the maximum BTU requirements for the roaster.

A water trap to collect condensation and loose particles should be installed in the gas supply line upstream from the roaster. See Figure 4.

2.0 INSTALLATION INSTRUCTIONS

2.4 GAS INSTALLATION (continued)

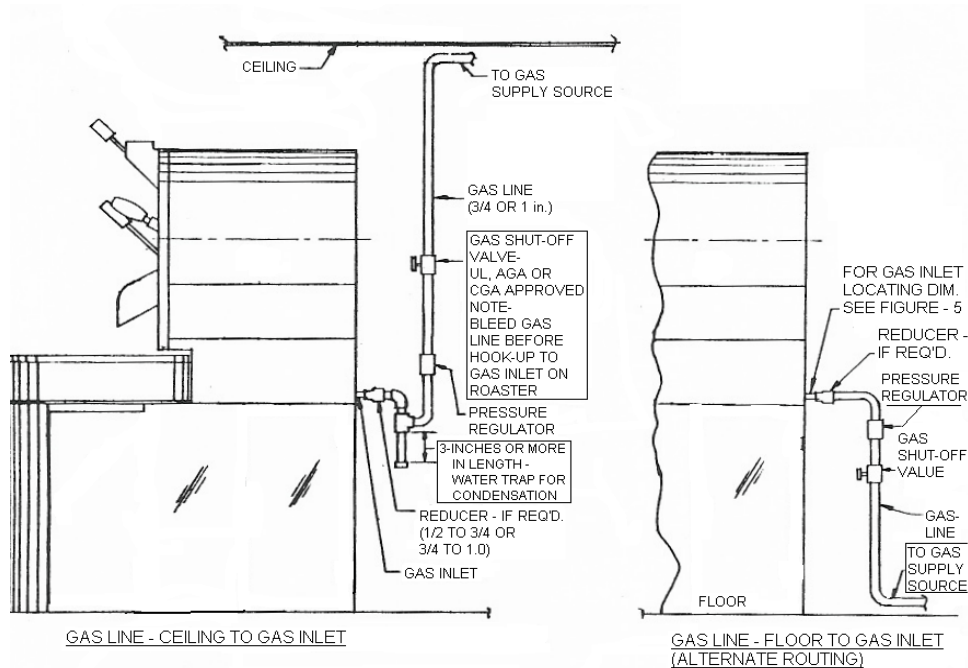


FIGURE 4 - INSTALLATION HOOK-UP FOR GAS LINE

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. The safety shut-off valve must be approved by UL in USA, AGA in Australia, CSA in Canada, or CE in the European Union.

2.4.2 PRESSURE REGULATOR

The roaster's factory installed regulator is preset to the pressure requirements of the roasters burners. Damage to the regulator can be caused if the incoming line pressure to the roaster exceeds 14" WCL (35 mbars). If the incoming gas pressure is in excess of 14" WCL (35 mbars), then a pressure regulator is required. Locate the regulator on the incoming gas supply line between the safety shut-off valve (See Figure 4) and the roaster's gas inlet. Diedrich Manufacturing, Inc. recommends 7" to 8" WCL (17.5 – 20 mbars) for Natural Gas and 11" to 13" WCL (27.5 – 32.5 mbars) for Liquid Propane at the roaster's gas inlet. These pressures are ideal for an optimally running roaster.

2.0 INSTALLATION INSTRUCTIONS (Continued)

2.4 GAS INSTALLATION (Continued)

Note: The WCL measurement on the manometer located on the top of the coffee roaster should read approximately 6" WCL (15 mbars) for Natural Gas and 10" WCL (25 mbars) for Liquid Propane when the burners are on full.

2.4.3 FLEXIBLE CONNECTIONS

If the roaster is to be installed with flexible couplings and/or quick-disconnect fittings, the installer must use heavy-duty design-certified commercial flexible connectors of at least ½ inch (1.3 cm) NPT (with suitable strain relief).

2.4.4 GAS INSTALLATION CHECK-OUT

Sizing of the gas supply line to the roaster is critical for proper performance. Ensure a licensed gas contractor or the gas company sizes the gas supply line in accordance with the maximum BTU demands of the roaster and any other appliances connected to the gas line. Check the roaster's and/or afterburner's data plaques for this information. Also, take into account any other appliances such as water heaters, furnaces, etc. when sizing the gas line.

The roaster must be isolated from the gas supply line by closing the safety shut-off valve during any pressure testing of the gas supply line.

Before connection to the roaster, open the gas shut-off valve for gas flow to bleed air out of the gas supply line. This ensures prompt ignition of the burners the first time the roaster is started. After bleeding, close shut-off valve and connect piping to roaster.

IMPORTANT: When the gas installation is complete have your contractors check the gas pressure at the point where the gas line connects to the roaster. The roaster and/or afterburner and any other appliances connected to the gas line should be running at the full flame setting for this test. The pressure at the roaster must be in compliance with paragraph 2.4.2.

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

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.

2.4.5 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 a 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.

Note: 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 (See Figures 5 and 12)

Use a locally licensed electrician for the electrical installation.

Electrical installation must conform to local, city, county, municipality, province, state, and national building codes, regulations, or laws. It is imperative that your licensed electrical contractor is familiar with which building codes, regulations, or laws apply. The roaster must be hard-wired (pipe conduit with grounding wire) from the electrical source to the roaster according to the name plate Full Load Amps and Voltage

Power connection for the IR-7, IR-12, and IR-24 manual control roasters is located in the Electrical box mounted on the bottom rear of the roaster. The IR-7 and IR-12 automated roasters are shipped with a power cord on the podium. The power connection for an IR-24 automated roaster is located in the electrical box located under the bottom shelf inside the podium.

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

2.6 ROASTER EXHAUST DUCTING (See Figure 5)

Compliance to local and national codes is critical for a proper installation.

Installation should be preformed by a licensed qualified technician

USE ONLY DOUBLE-WALL, POSITIVE PRESSURE PS GREASE DUCTING OR SINGLE-WALL, WELDED SEAM 18-GAUGE (1.3 mm thick) STEEL DUCTING.

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

DIEDRICH MANUFACTURING, INC. RECOMMENDS THAT POSITIVE PRESSURE GREASE DUCTING IS INSTALLED WITH CLEARANCES TO THE DUCTING MANUFACTURER'S SPECIFICATIONS

Roaster Models - Dimensions in Inches & Centimeters			
	IR-7	IR-12	IR-24
A: Exhaust Air Outlet Height	16 / 40.6	17 / 43.2	21 / 53.3
B: Exhaust Air Outlet (Centerline from back left side)	7.0 / 17.8	7.0 / 17.8	9.5 / 24.13
C: Electrical Junction Box Height	17.5 / 44.5	17.5 / 44.5	14.5 / 36.8
D: Gas Inlet (also see fig.5)	32.5 / 82.6	32.5 / 82.6	29.5 / 74.9
E: Exhaust Duct Air Flow - CFM	290	290	580

*Duct diameter may be larger because of individual installation requirements.

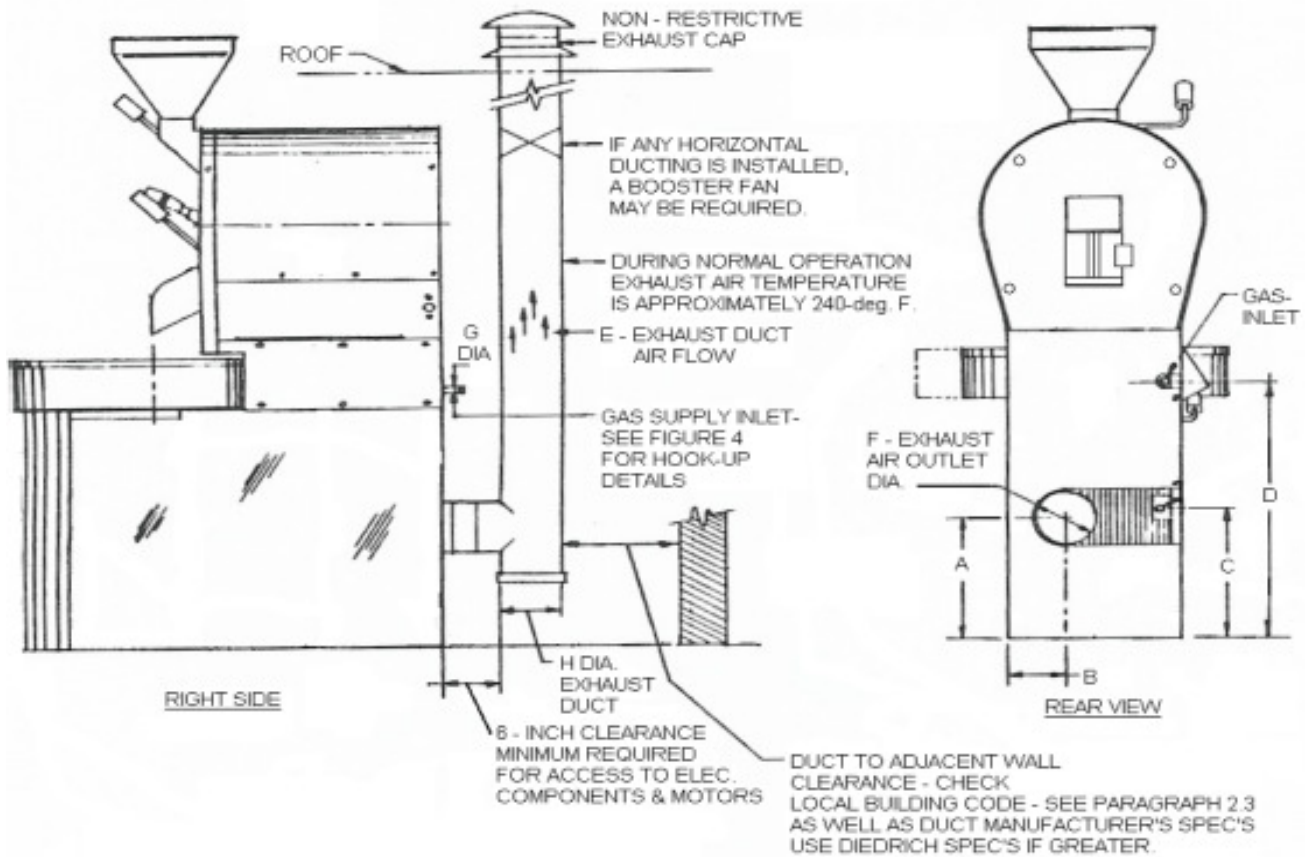


FIGURE 5 - INSTALLATION HOOK-UP DIMENSIONS FOR EXHAUST AIR DUCT AND ELECTRICAL JUNCTION BOX

Note: Duct diameter may be larger because of individual installation requirements.

2.0 INSTALLATION INSTRUCTIONS (continued)

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 a particular model of roaster as indicated in Table A (Technical Specifications) on page 5.

The exhaust system must be designed to operate with a static flue pressure between 0.25"wc and – 0.15"wc at the combustion blower exhaust of the roaster while in operation.

Restricted air flow caused by a build up of residue presents a severe fire hazard. Consult the separate Ducting Requirements Sheet sent with this operations manual.

A faulty design of the exhaust ducting system can result in a restricted airflow 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 airflow 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°F (593°C) continuous and 1400°F (760°C) intermittent operating temperatures. The ducting must be installed to the ducting manufacturer's clearance specifications. **Note:** Always check with local codes due to different regulatory requirements.

Wherever possible, the ducting should be installed in a straight, vertical line from the roaster to and through the roof.

Eliminate or minimize the number of elbows as they reduce the exhaust airflow efficiency from the roaster's blower. Minimize the use of 90° elbows. Each 90° elbow effectively increases the duct length by 5-10 feet (1.5 – 3 m). To obtain adequate airflow use 45° elbows to construct gradual turns *if possible*.

If the duct run is longer than 25'-30' (7.6 - 9.2 m), the duct diameter size may need to be increased by at least 1" (2.5 cm) diameter after the first 10 feet (3 m) to improve airflow performance. A booster fan may be required at the end of the duct run; to be sure consult an airflow engineer.

2.0 INSTALLATION INSTRUCTIONS (Continued)

Where ducting changes direction, use a T 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

Positive Pressure Grease Duct Vent 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.**

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 Positive Pressure Grease Ducting Vent Systems weigh a considerable amount. Make certain that the duct is properly supported and that component parts are not overloaded and that adequate auxiliary structural members are used.

Note: The roaster must not, under any circumstances, support the weight of the exhaust system.

2.6.3 RECOMMENDED DUCTING SOURCES

See current Diedrich Manufacturing, Inc. Ducting Requirements Sheet enclosed with this Owner's Manual.

2.7 INSTALLATION INSPECTION

After completing hook-up of the exhaust duct system, gas and electrical connections, check the operating control panel. See Figure 6. Be sure all switches and the flame controls are in the "OFF" position. Turn "ON" one switch at a time.

NOTE: After completing the installation of the roaster, locate two or more fire extinguishers near the roaster and readily accessible by the operator. Consult with your local fire marshal for recommendation of an appropriate type fire extinguisher. See paragraph 10.1.

WARNING

The completed roaster installation MUST BE INSPECTED for compliance with these Diedrich Manufacturing, Inc. installation instructions by local city or county building inspectors and by the local fire inspector BEFORE OPERATING THE ROASTER. Failure to have these inspections performed may invalidate the warranty and will relieve Diedrich Manufacturing Inc. of any liability associated with the installation and use of your machine.

3.0 INITIAL START-UP (for drum seating - read carefully)

See Figures 6 and 7.

Note: 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:

- 3.1 Place airflow control handle in "50/50" (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 Manufacturing, Inc., for instructions.
- 3.2 If no rubbing sound is heard with the drum still rotating, set gas switch to "ON". Move flame control to obtain a low flame setting, after several seconds you will hear the igniter clicking. The ignition system has a 10 second lock out. If the pilot does not ignite after 10 seconds turn the gas switch off. Turn the gas switch back on and repeat this procedure of turning the gas on for 10 seconds then off until the pilot lights. If the gas line was not sufficiently bled this sequence may need to be followed for two or three minutes.

Note: The first time the pilot ignites, extra time may be necessary to allow air to bleed out of the gas line. Following the ignition of the pilot, up to two to three minutes may be required to allow the two infrared burners to ignite for the first time. Watch through the view window for burner ignition

- 3.3 Move flame control to obtain a medium flame setting while the drum continues to rotate. If a rubbing sound is heard, stop operation and contact Diedrich Manufacturing, Inc. for instructions.
- 3.4 Move flame control to a high flame setting and watching the digital temperature unit on the control panel, let roaster warm to 415° F (213°C). If no rubbing sound occurs up to 415° F (213°C) the initial warm-up is completed and the roasting can commence. If a rubbing sound continues, stop operation and contact Diedrich Manufacturing, Inc. for instructions.

Note: During initial warm-up, DO NOT let roaster heat exceed 415° F (213°C) the roasting drum rotating.

- 3.5 Check the exhaust system for leaks. If leaks are present, the ventilation contractor must be notified to correct the situation.

This completes the initial start-up procedure.

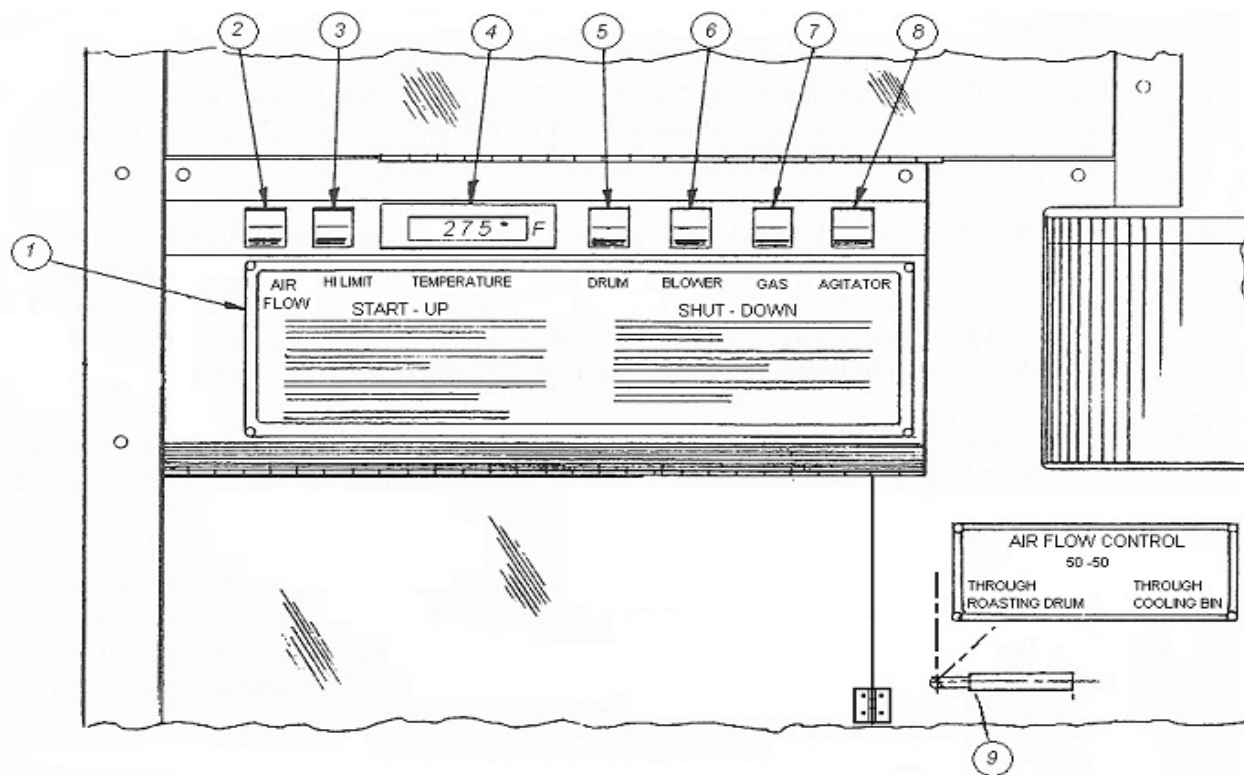


FIGURE 6 - OPERATING CONTROLS PANEL

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 a Robusta coffee as it does not emit enough oil for the seasoning process.

The new drum requires from 5 to 10 seasoning roasts to become properly oiled. Each seasoning roast requires about 10-15 pounds (4.5 to 6.8 kgs) 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 400°F (204°C). Follow the initial steps for setting controls noted in the 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 airflow control handle from the "50/50" (mid) position to the "THROUGH COOLING BIN" position. The coffee will change in color from green to a pale yellow. During this progression, and looking through the drum door view window, you will start to see chaff, the bean's outer skin, separating from the coffee bean. Unwashed coffee has considerably more chaff than washed coffees.
- 4.3 As the coffee develops from the green to the yellow stage and chaff is visible through the view window, the airflow control handle must be temporarily moved to the roasting drum position so that the increased airflow will remove the chaff from the roasting drum. Leave the airflow control handle in the "THROUGH ROASTING DRUM" position for less than a minute, until the coffee becomes clean and free of chaff.
- 4.4 When the coffee is free of chaff return the airflow control handle to the "THROUGH COOLING BIN" position. This procedure must be repeated once or twice during the early stage of the roasting. If the chaff is not pulled out of the drum with the increased air flow at this stage of the roast (before it is broken up and soaked with oil) it will become more difficult to separate from the beans; even the increased air flow through the drum during the latter part of the roast may not be sufficient to clean the coffee. As a result, the compartment below the cooling bin screen will require more frequent cleaning.
- 4.5 When the coffee reaches the yellow stage 280°F (138°C); the airflow control handle must be moved to the "50/50" (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 uniform heat medium. The roast will progress from the yellow to the cinnamon color as the coffee begins to expel a fair volume of carbon dioxide (CO₂) gas.
- 4.0 **SEASONING THE ROASTING DRUM** (continued)
- 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 airflow control handle to the "THROUGH ROASTING DRUM" (horizontal) position for the remainder of the roast.
- 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. At this point in the roast, with good lighting, you should 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 airflow control handle to the "THROUGH COOLING BIN" position.

As the coffee reaches a temperature of 340°F (171°C) the chemical changes in the coffee start an exothermic reaction (the chemistry creates its own heat). This exothermic reaction continues through the remainder of the roast. The high limit system turns the gas off at 465°F (240°C) but the temperature continues to rise due to the exothermic heat. If the coffee is not removed from the drum at 500°F (260°C), the coffee may ignite even though the flame was turned off at 465°F (240°C).

When the coffee temperature reaches 465°F (240°C), the high limit automatically turns off the gas flow to the burners and activates the high limit alarm. After the temperature drops to 450°F (232°C), press the high limit reset button on the control panel to restore the gas flow to re-ignite the burners and silence the alarm.

- 4.8** Load the next batch of green beans into the drum. After the coffee is in the drum, reset the high limit alarm and turn the flame “ON” to start the next roast. Repeat this complete dark roasting cycle (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)

Unlike other flame heated roasters, the Diedrich IR Series Roasters use efficient infrared, gas-fired burners to produce radiant heat. This heat is directed at the roasting drum as well as the heat exchangers to produce the hot air required for the roasting process. The heat from the heat exchangers is then directed to the roasting drum and transferred by conduction to the tumbling coffee beans.

The roasting techniques used on a Diedrich Roaster are somewhat different than other roasters. This radiant heat medium gives the operator much more control over both air flow and drum temperatures - thus making the Diedrich Roaster the most versatile roaster on the market.

5.0 START-UP (for Roasting) (Continued)

- 5.1** Place airflow control handle to "50/50" (mid) position. See Figure 7.

- 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. Watch through viewing window for burner ignition.
- 5.5 After burner ignition, move the airflow control handle from the "50/50" (mid) to "THROUGH COOLING BIN" (vertical) position. The handle remains in this position throughout the early part of the roast.
- 5.6 Preheat the empty drum until the digital unit reads 415° (213°C). The digital temperature unit's thermocouple is mounted on the front end 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°F (204-232°C).

6.0 ROASTING FOR CONSUMPTION

These instructions explain how to operate the roaster. It is not an attempt to teach all the subtleties and proper techniques of roasting the many varieties of coffee beans. For this, Diedrich Manufacturing, Inc. offers monthly roasting classes.

Recommended roasting times are from 14 -15 minutes for a light roast and 15-18 minutes for a darker roast, depending on the source or type of beans. If the beans roast too fast, reduce the heat during the roast. The temperature of the roasting system (comprised of the coffee beans, roasting drum, and the end plates) reacts slower than the heat adjustments. So do not expect a quick temperature change on the thermometer when the heat level 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, you can develop a consistent roast for current and/or future roasts.

Sampling of beans should be consistently viewed under **a full-spectrum natural fluorescent lamp**, regardless of day or night, to maintain a consistent sample comparison. Refer to paragraph 2.1.

6.0 ROASTING FOR CONSUMPTION (Continued)

- 6.1 After the roaster's empty drum has been preheated to a thermometer reading of 415°F (213°C) temperature (see paragraph 5.6 preceding), use the funnel to load the green beans into the hopper. **Never allow the beans to sit for any length of time in the**

hopper. In this area of the roaster the metal becomes very hot and will result in pre-roasting, uneven roasting or even scorching of the beans.

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 time will be longer.

6.2 Adjust the flame control to an appropriate heat setting for the size of the batch of coffee to be roasted. The larger the batch, the greater the heat absorbing capacity, and the higher the heat can be raised without accelerating the roast.

6.3 To start the roasting process, move the airflow control handle to the "THROUGH COOLING BIN" (vertical) position. This splits the airflow, moving 20% through the drum and 80% through the cooling bin. This allows sufficient airflow 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 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. Our philosophy is to allow the beans to absorb heat at their own natural absorption potential, as various types of coffee have different weight densities and absorb heat differently.

6.4 Watch through the discharge gate window for the separation of chaff from the beans. Move the airflow control handle to the "THROUGH ROASTING DRUM" (horizontal) position. This changes the airflow split to 80% through the drum and 20% through the cooling bin. This increased flow of air through the drum exhausts the chaff which is shedding from the beans out of the drum.

Leave the airflow control handle in the "THROUGH ROASTING DRUM" (horizontal) 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.

This chaff removal procedure is very important especially when working with those coffee varieties 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 airflow control handle back to the "THROUGH COOLING BIN" (vertical) 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 time reference.

6.0 ROASTING FOR CONSUMPTION (Continued)

6.5 (Continued)

You should be into the roast six to seven minutes when the coffee reaches this yellow color. If you are at six minutes but far from the yellow color, the coffee requires more heat. If you are at four minutes and the coffee is already turning yellow, you need to reduce the heat.

6.6 When the beans have reached the yellow color, move the air flow control handle to the "50/50" (mid) position until the beans reach a cinnamon brown color at 370°F (188°C).

The cinnamon brown color is another checkpoint that is easily identifiable. You should reach this color at 13-14 minutes into the roast. 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.

A chemical change in the beans starts to produce a large volume of carbon dioxide (CO₂) gas when the beans reach the cinnamon brown color. This gas will pressurize the roasting drum if the airflow is not increased. Normally a pressurized roasting vessel is the most efficient heat transfer medium, but for coffee, a pressurized roasting drum will hinder the bean development. As more airflow through the drum is needed, move the airflow control handle to the "THROUGH ROASTING DRUM" position.

The darker the roast, the more smoke is produced. This requires a greater airflow 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 at least to this stage. 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 airflow control to the "THROUGH COOLING BIN" (vertical) position and turn the flame "OFF". Then, all that remains is to discharge the coffee into the cooling bin.

6.7 (Continued)

After the coffee has been in the cooling bin for a minute or so, turn off the agitator and spread out the coffee. Remove the coffee from the cooler discharge gate. With the agitator turned off, the air can find a path through the coffee. The air is hindered if the coffee is in motion. This will allow the coffee to cool faster.

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 close to the same temperature as indicated on the digital temperature unit. This allows the next roast to be started immediately.

When the beans have cooled to room temperature, position a container under the cooling bin chute, turn on the agitator if equipped, and discharge the beans out of the cooling bin. Set agitator switch to “OFF”.

Note: At any time during the roasting process you notice excessive smoke in the room, smoke coming from the sample trowel port, or after roasting the discharged beans require longer cool down times than usual, then check for the following:

1. An excessive build-up of residue throughout the airflow system within the roaster.
2. An excessive build-up of residue 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” position.

7.2 After the roasted beans in the cooling bin have cooled to room temperature, move the air flow control handle to the "THROUGH ROASTING DRUM" (horizontal) 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°F (121°C) or lower, set the blower and drum switches to “OFF”. Make sure the flame control is turned to the “OFF” position.

7.4 Remove the chaff from the lower compartments of the roaster. Open the side doors to remove chaff and for general cleaning. Inspect for smoldering chaff. If found, extinguish with water (a small spray bottle is handy for this purpose). Vacuum out the cooled chaff.

WARNING! NEVER LEAVE THE ROASTER AFTER ROASTING WITHOUT CLEANING OUT THE CHAFF.

Note: For faster cooling of the roaster, leave all the doors closed, place the airflow control handle in the “THROUGH ROASTING DRUM” position. This action moves the air through the roasting drum cooling down the complete system evenly and efficiently.

| This completes the shutdown procedure

8.0 ROASTING AND CLEANING LOG - See Table B and Figure 8

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 beans have 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. Example:

$$15 \text{ lbs. IN minus } 12.75 \text{ lbs. OUT} = \frac{2.25 \text{ lbs.}}{15 \text{ lbs. green}} = 15\% \text{ weight loss}$$

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 airflow passages may be plugging up. Roast times are also important to calculate total times 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 - (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 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

NOTE: 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!

This completes the roasting and cleaning log procedure.

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***.

Accumulated chaff and oil residues are extremely flammable. Poor airflows can result in a build-up of flammable gases in the roaster as well as the exhaust ducting. Residue also insulates the ducting from within, resulting in higher internal duct temperatures.

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

Establish a cleaning schedule (see Table C) 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 the information in Table C is available from the data gathered in the Roasting and Cleaning Log, Table B.

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. The moisture will adhere to the roaster's internal components and exhaust duct causing build-up to accumulate faster.

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. With darker roasts, more oils come to the surface of the bean, which in turn contributes to more oil in the exhaust smoke. The oily smoke adheres to all surfaces it comes in contact with. 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 (i.e., Central and South American) coffees. Thus, if more unwashed coffees are roasted than washed coffees, the chaff box, burner tray and cooling bin require more frequent cleanings.

Cleaning Items	See Para.	Every 4 Hrs Roast	Every 12 Hrs Roast	Every 60 Hrs Roast	Every 150 Hrs Roast	End Day	Every 2 Wks	Monthly	Every 6 Months	Annual
Inside / Outside Roaster General clean-up, remove chaff	9.2 9.12					●	●	●	●	●
Lower Compartments General clean-up, remove chaff	9.6	●				●				
Drum Chaff Tray General clean-up, remove chaff	9.7		●			●				
All Compartments Thorough cleaning	9.5 9.6 9.7 9.9			●				●		
Cooling Bin a. General clean-up b. Remove & clean screen	9.8		●				●		● ●	
Blower - Impeller / Housing Clean Impeller - See Note 2	9.9			●				●		
Chaff Collector Duct Clean & remove chaff	9.10									
Exhaust Ducting - See Note 3 (from Roaster to outside vent) Clean residue, remove chaff	9.11						● see Note 3			● See Note 2

- Cleaning time periods may be adjusted based on data acquired from the Roasting and Cleaning Log. Every roast should be logged. Residue may build-up faster depending on the type of coffee roasted. The degree of the roast may also dictate more frequent cleaning of the Roaster.
- Blower housing residue build-up must not exceed 1/8 inch. If so, more frequent cleaning will be required.
- Cleaning of exhaust ducting requires the service of a professional licensed and bonded chimney sweep experienced in cleaning industrial or restaurant equipment that is subject to heavy tar or oily build-up. Duct residue build-up must not exceed 1/8 inch build-up in elbows or exhaust cap or any other section of ducting.

TABLE C - ROASTER CLEANING SCHEDULE

9.0 CLEANING (Continued)

9.1 Continued from page 29

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 B) is [very](#) important.

9.2 DAILY BASIS - Spend about five minutes to do a general cleaning, inside and out, checking for residue build-up. After every four hours of roasting, remove the chaff from the lower compartments (see Paragraph 9.6). To maintain sanitary standards and general appearance, clean and polish the outside surfaces of the roaster (see Paragraph 9.12) on a regular basis. Before leaving the roaster at the end of the roasting day, clean and remove the chaff from the lower compartments 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 (see Paragraph 9.7) located directly under the drum.

9.4 EVERY TWO WEEKS or less, clean the cooling bin to retain cooling efficiency (see Paragraph 9.8).

9.5 AFTER 60 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 (see Paragraph 9.9).

AFTER 150 HOURS OF ROASTING, clean the collector duct (see Paragraph 9.10). **The first three 40 hour cleaning cycles should include checking the tension of the drum drive chain.**

9.6 LOWER COMPARTMENTS

These compartments collect the chaff from the roast. Clean out the chaff after every four hours of roasting **and before leaving roaster at the end of the roasting day**. The compartments with access doors are located under the cooling bin and under the drum area.

Inspect for smoldering chaff. Extinguish with water (a small spray bottle is handy). 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.

9.0 CLEANING (continued)

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 doors on each side of the roaster, above the control panel. Keep clean by vacuuming or sweeping chaff before it exceeds a depth of ¼". Use care in cleaning around pilot gas lines and electrode leads. A bent gas line can hamper burner ignition.

9.8 COOLING BIN - Also see paragraph 9.12.

For cooling efficiency and to prevent fire hazard, the area below the screen must be cleaned along with the lower compartments after every four hours of roasting. The area under the cooling bin is accessible from the chaff box door.

When chaff and oil build-up below the screen becomes excessive, chaff will pass through the exhaust ducting. Clean the wire brushes of the agitator assembly. At least every six months, remove the screen from the bin and thoroughly clean both sides of the screen.

TO REMOVE SCREEN (see Figure 12):

- A. Lift agitator assembly from gearbox drive shaft.
- B. Remove two screws to detach U-shaped slider retaining plate.
- C. Remove two screws to detach screen from crossbar support assembly.
Remove five screws to remove screen retainer strap. The two rear screws are accessible by removing the panel opposite the controls. Lift out screen to clean.
- D. Before reassembling in reverse order, clean the agitator assembly brushes and return arms.

9.9 BLOWER IMPELLER - See Figure 9.

Clean impeller and its housing after every 60 hours of operation, or more often if residue exceeds 1/8" (.3 cm) build-up. The impeller blades should be removed and thoroughly cleaned to retain balance. This also allows access to the blower housing for cleaning. A slight imbalance caused by residue on blades will cause vibration and uneven wear on blower motor bearings. Cleaning frequency will be influenced by bean moisture content as well as ambient air moisture.

9.0 CLEANING

9.9 BLOWER IMPELLER (Continued)

TO CLEAN:

- A. Open access door at lower right rear of roaster.
- B. Remove both thumbscrews and remove impeller cover assembly.
- C. Remove the impeller set screws and pull the impeller from the motor shaft.
- D. Use putty knife to clean off residue from impeller and housing. Use industrial strength liquid cleaner to scrub aluminum impeller (do not use oven cleaner).

9.10 CHAFF COLLECTOR DUCT - see Figure 2.

Clean after 150 hours of roasting if residue build-up exceeds 1/8" (.3 cm) thickness.

TO CLEAN:

- A. Remove rear upper cover panel.
- B. Remove chaff collector duct cover.
- C. Scrape clean the duct and cover. Care must be taken not to damage the vacuum sensor tube. This tube should also be checked for any restrictions. If damage is found, remove.
- D. While chaff collector panel is removed, check the tension on drum drive chain (see paragraph 10.6).

9.11 ROASTER EXHAUST DUCTING - see Figure 5

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

9.0 CLEANING (continued)

9.11 ROASTER EXHAUST DUCTING (Continued)

Every month, check the ducting from the roaster to the outside of the building for residue build-up. If residue thickness exceeds 1/8" (.3 cm) 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" (.3 cm) per year, clean system annually in order to prevent the accumulated residue from becoming baked-on surfaces, making it impossible to clean.

Excessive build-up of residue will have an adverse effect on the airflow and 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.

Coffee residue is just as flammable as wood stove creosote, so proper cleaning is of the utmost importance. ***Fire prevention cannot be stressed enough!***

9.12 GENERAL CLEANING - see Figures 1 & 2

Outside painted surfaces can be cleaned with a mirror glaze (Maguire's Mirror Glaze is recommended and available at most paint stores or Plexiglas shops). Use of a mirror glaze (rather than a wax-based cleaner) prevents the paint from becoming hazy, a result of roasting heat on the paint. The view windows, chute and agitator assembly (in cooling bin) are easier to clean while they are still warm from roasting heat. For polishing brass or stainless parts, use only a polishing compound made for these types of metals.

This completes the roaster cleaning procedure.

10.0 MAINTENANCE - See Table D

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

Note: (one each) to be available for cleaning and maintenance:

TOOLS REQUIRED:

Allen wrench set
 Combination wrench set,
 5/16, 3/8, 7/16, 1/2, 9/16, 5/8
 Fire Extinguishers,
 Dry chemical or carbon dioxide,
 two or more (refer to paragraph 2.7)
 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 airflow)

LUBRICANTS REQUIRED:

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

Service Item	See Paragraph	Service Period
Blower motor, oil.	10.2	Every 6 months.
Roasting Drum Drive Chain, oil and adjust	10.5, 10.6	Every 6 months
Roasting Drum Bearings, lubricate	10.7	20 hours roasting
Burner & Drum Chaff Tray, Access Doors, lubricate hinges, clean	10.8	Every 6 months
Agitator Brush Assembly, adjust	10.10	As required
Air flow Control Handle, lubricate	10.11	Every 6 months

10.0 MAINTENANCE - (Continued)

10.2 BLOWER MOTORS - See Figure 9

Bearings should be oiled every six months, with sewing machine or light oil. For access, open lower left cover panel. On control panel, set blower switch to “OFF”. Locate the two plugs, one on each end of motor. Apply 2-3 drops oil. Do not over-lubricate.

10.3 AGITATOR MOTORS - See Figure 10

Sealed motor. No service required.

10.4 DRUM MOTORS - See Figure 11

Sealed motor. No service required.

10.5 ROASTING DRUM DRIVE CHAIN - See Figure 2

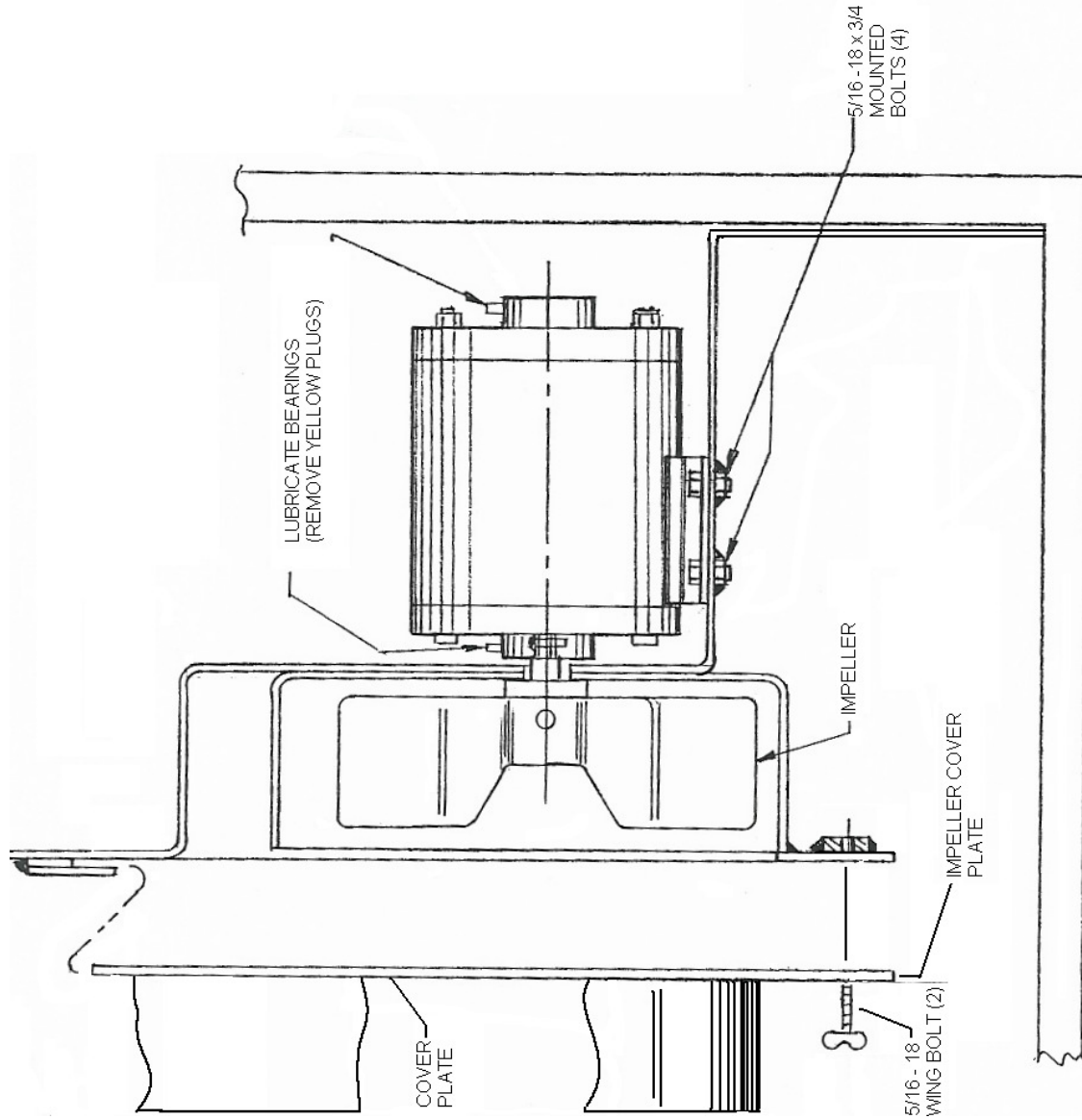
Oil every six months with SAE20 non-detergent or sewing machine oil. For access, remove rear upper and lower cover panels. At control panel, set drum switch to “OFF”. and turn off power at main electrical control panel. Apply 4-5 drops of oil to chain at various intervals. Do not over-lubricate.

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

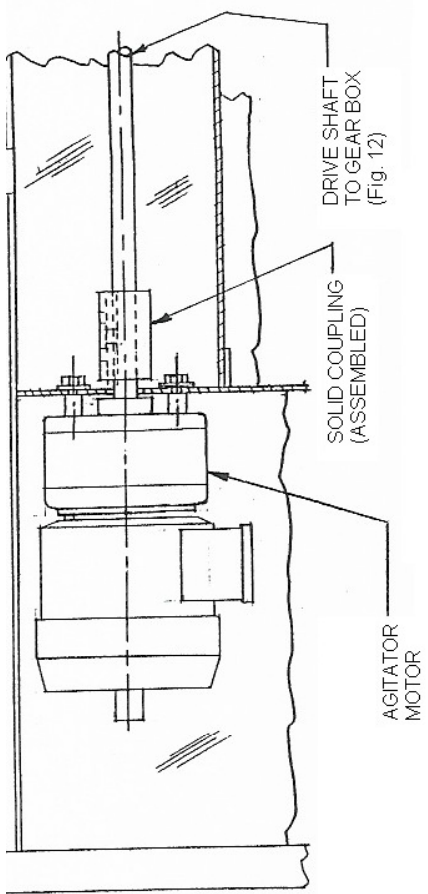
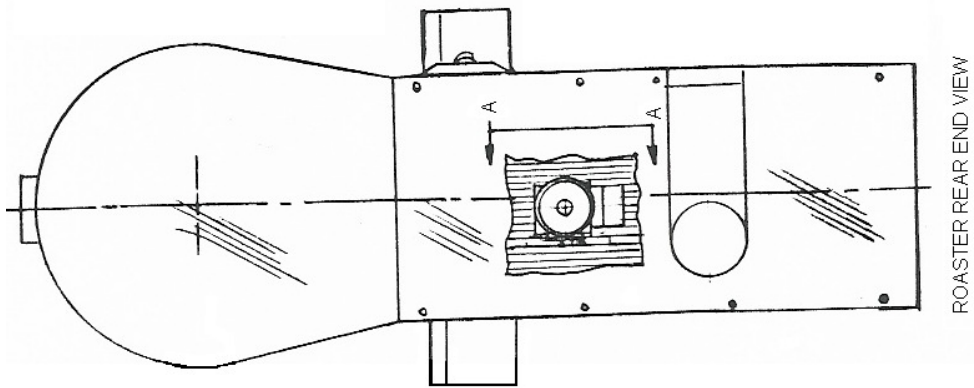
While chain is still accessible, check chain adjustment. Correct chain adjustment is achieved when there is 3/4 to 1-inch (1.9 – 2.5 cm) of slack in the chain loop when squeezed together mid way between the two sprockets.

10.6 ROASTING DRUM DRIVE CHAIN ADJUSTMENT - See Figure 2

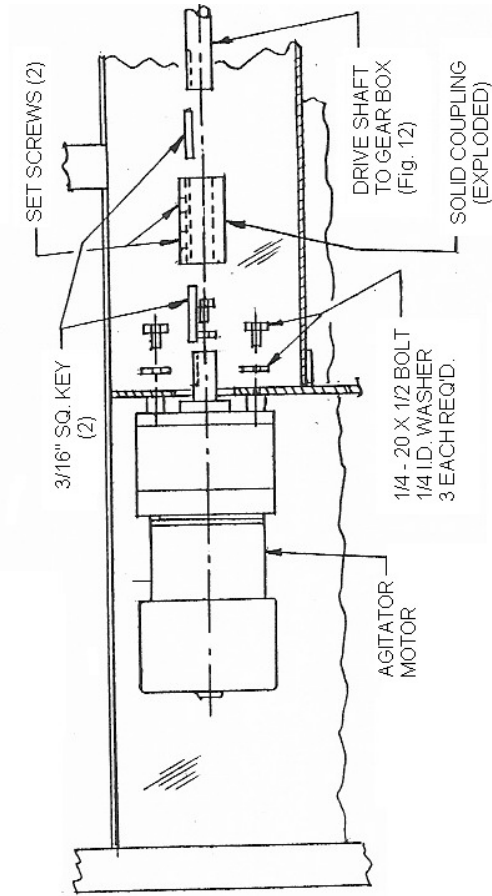
With the drum motor turned “OFF” and roaster disconnected at electrical source, the chain can be adjusted. Loosen the drum motor mounting bolts and firmly push down on the motor until its weight draws the slack out of the chain. Use wrench to tighten the mounting bolts securely to prevent a loose engagement of chain and motor sprocket. When tightening bolts, be sure motor remains in a level, horizontal position. With a new machine the drum drive chain may need to be adjusted several times to compensate for the initial stretching of the chain. After completing the first 40-hour cleaning check the tension of the chain and adjust accordingly. **The first three 40 hour cleaning cycles should include checking the tension of the drum drive chain.**



BLOWER HOUSING SIDE VIEW
FIGURE 9 - BLOWER MOTOR AND IMPELLER



VIEW A-A
DETAILED PARTS ASSEMBLED



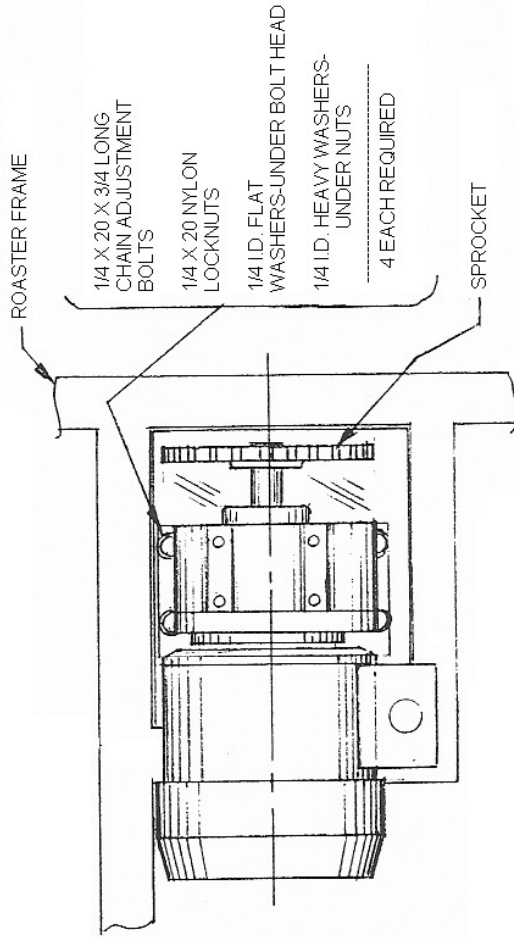
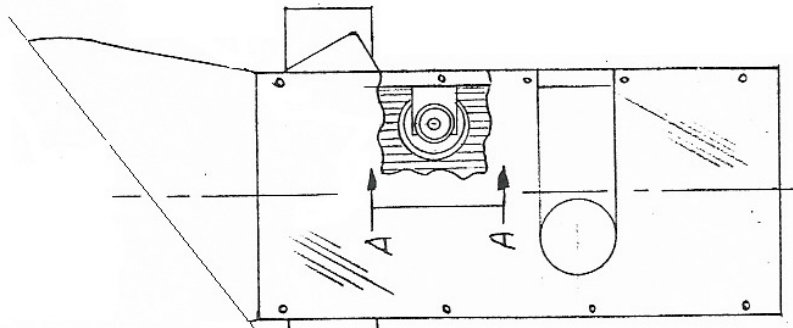
VIEW A-A
DETAIL PARTS EXPLODED

FIGURE 10 - AGITATOR MOTOR AND DRIVE SHAFT

ATTACHED TO ROASTER FRAME WITH

- 7/16 - 20 x 3/4 LONG BOLTS
- 7/16 - 20 NYLON LOCKNUTS
- 7/16 ID. FLAT WASHERS
- 7/16 ID. HEAVY WASHERS

4 EACH REQ'D.



ROASTER MODELS IR-7 & IR-12 INSTALLATION SHOWN
ROASTER MODEL IR-24 INSTALLATION SIMILAR

VIEW A-A LOOKING OUTBOARD

FIGURE 11 - DRUM MOTORS

10.0 MAINTENANCE - (Continued)

10.7 FRONT AND REAR DRUM BEARING – See Figures 1 & 2

Bearings should be lubricated every 20 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. Lubrication is best done upon finishing the day's roasting while the roaster is still warm at 250°F (121°C).

To lubricate the front bearing attach grease gun to bearing fitting. Bring operating temperature to approximately 250°F (121°C). With drum rotating, use grease gun to inject 2-3 pumps of grease into the bearing fitting.

Before lubricating the rear bearing **STOP THE DRUM FROM ROTATING**. Insert the grease gun fitting **WITH BOTH HANDS CLEAR OF CHAIN AND SPROCKET**. Start the drum rotating. Inject 2-3 pumps of grease into the 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.

10.8 BURNER & DRUM CHAFF TRAY ACCESS DOORS - See Figures 1 & 2.

Lubricate both sides of door hinges every six months. Spray with WD-40 spray lubricant. Afterward wipe both doors and adjacent surfaces clean. Doors provide access to clean or service burners, pilot igniter electrodes and drum chaff tray.

10.9 AGITATOR DRIVE SHAFT Couplings - See Figure 12.

There are two couplings. One at the front of the agitator assembly connected to the gear box one at the back of the assembly connecting it to the motor shaft. These couplings have set screws holding keys in keyways to keep the assembly turning smoothly. The set screws should be checked every six months to make sure they do not come loose and allow the keys to slip.

10.10 AGITATOR BRUSH ASSEMBLY ADJUSTMENT - See Figure 12.

To adjust, loosen setscrews in the agitator arm. Push brush down until brush bristles slightly touch the cooling bin screen. Tighten setscrews, being careful to not over-tighten.

10.0 MAINTENANCE (continued)

10.11 AIR FLOW CONTROL HANDLE - See Figure 7

Lubricate every six months with high temperature grease.

10.12 COOLING BIN - See Figures 10 and 12. Reference: Paragraph 9.8.

To remove cooling bin assembly from Roaster frame:

- A. Open lower chaff compartment door to gain access to the universal coupling located under cooling bin.
- B. Using an allen wrench, loosen the two setscrews in the coupling connecting the gearbox and the drive shaft. Slide coupling along drive shaft to detach latter from gearbox shaft.
- C. From cooling bin's topside of screen, remove the 1/4-20 x 2 1/4-inch long phillips mounting screws that attach the cooling bin to the frame of the roaster.
- D. Lift and tilt up and outward to remove the entire cooling bin assembly from roaster frame.

To reassemble cooling bin:

- A. Tilt and lower cooling bin to seat over the screw holes in frame of roaster. It is helpful to use a pair of small pins (diameter of screws) to align the holes in the screen and through to the holes in frame of roaster. Install the mounting screws. Before tightening, have all screws partially threaded into the frame of the roaster.
- B. Align drive shaft so the flat surfaces on the gearbox and shaft are aligned. Reposition coupling on drive shaft to shaft on gearbox. Tighten the two setscrews.

This completes the maintenance instructions.

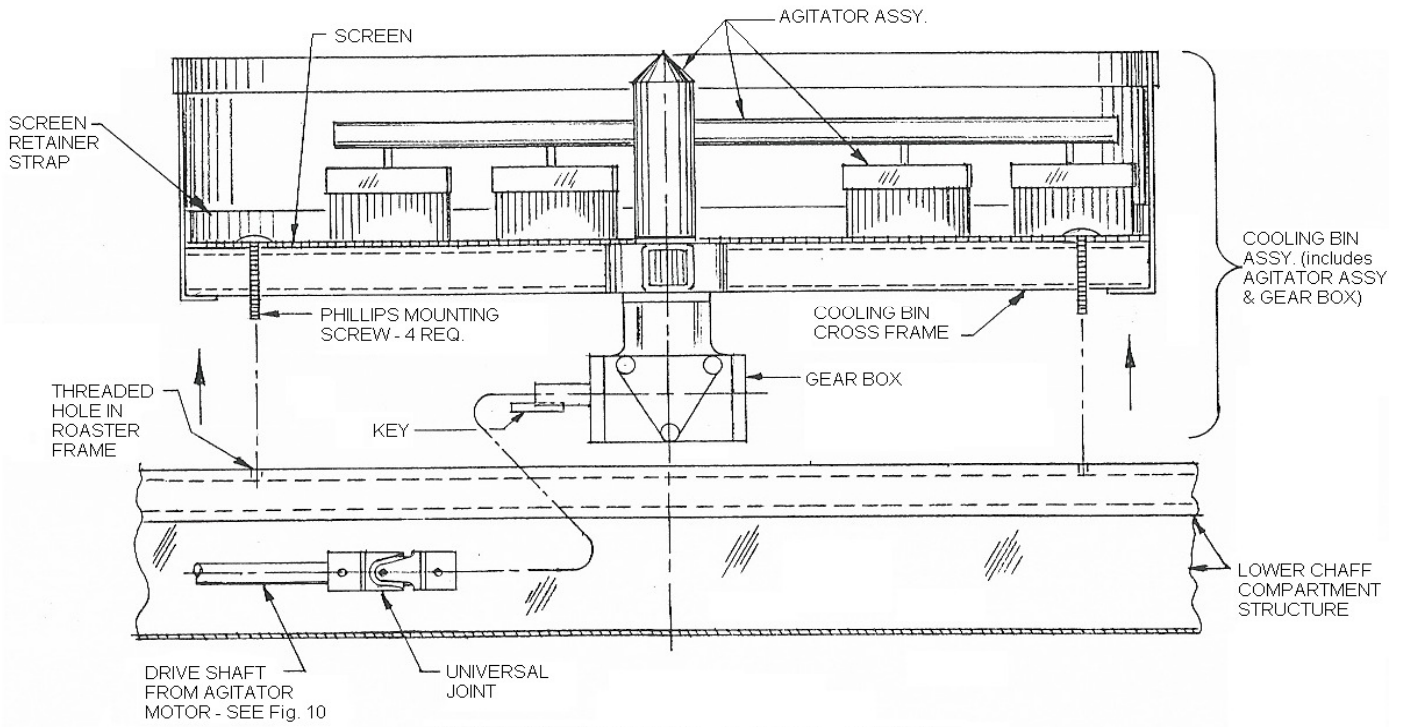
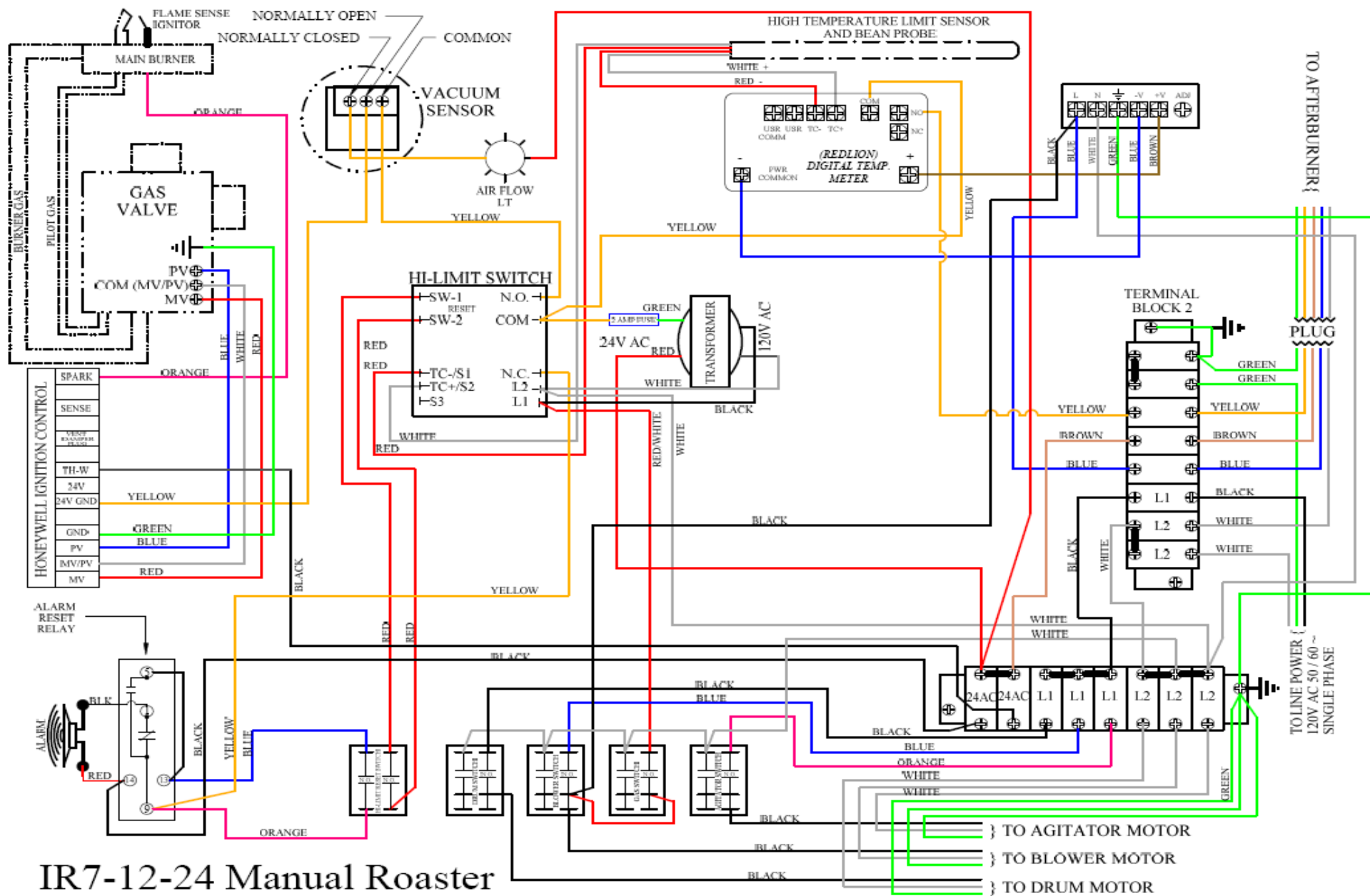


FIGURE 12- REMOVAL OF COOLING BIN



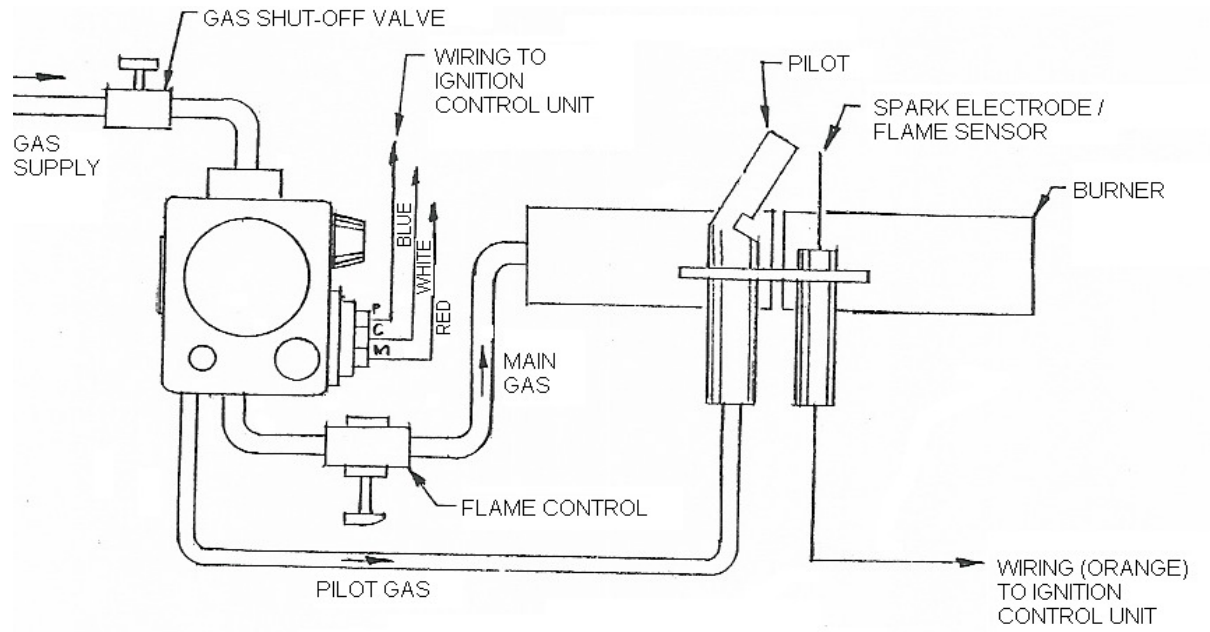


FIGURE 14 - GAS SYSTEM - BASIC

11. FIRE CONTROL - READ CAREFULLY AND PRACTICE!!!

Roaster Fire Checklist For IR-Series Coffee Roasters

- ___ 1. Turn the **gas shut-off valve** on the gas supply line to the roaster to the **"OFF"** position.
- ___ 2. Turn the Blower Motor "OFF" on the Roaster's Control Panel.
- ___ 3. Identify the location of the fire
 - ___ Roasting Drum – go to step 4.
 - ___ Cooling Bin/Below Cooling Bin Screen – go to step 5.
 - ___ Blower Compartment/Ducting - go to step 6.
 - ___ Chaff Collection Compartment – go to step 7.
 - ___ Under the Roasting Drum – go to step 8.
 - ___ Electrical Panel/Motors – go to step 9.

4. Roasting Drum Fire.

Warning! Do not discharge coffee into cooling bin. Exposure to fresh oxygen will accelerate the fire.

- ___ Locate Water Spray bottle and CO2 Fire Extinguisher.
- ___ Turn the Drum Motor "ON" at the control panel.
- ___ Remove Sample Trowel and spray water into the sample trowel tube, if unable to proceed to next step.
- ___ Remove the Aluminum funnel and pull up on the Hopper Handle.
Spray water into the hopper.
- ___ If water does not extinguish the fire repeat the process using the CO2 fire extinguisher. This procedure will insert the flame retardant into the roasting drum and should put out the fire. Repeat if necessary.
- ___ **Fire is out of control.**

Disconnect main power supply and call 911 or Fire Department and evacuate all personnel to a safe area away from fire and smoke.

- ___ Fire is completely extinguished, proceed to Step-10.

5. Cooling Bin Fire/Below Cooling Bin Screen

- ___ Turn the Blower and "OFF" on Control Panel.
- ___ Locate water spray bottle or CO2 Fire Extinguisher.
- ___ Ensure Agitator is "ON" at the Control Panel.
- ___ Discharge water or CO2 liberally over the whole cooling bin surface area while the coffee is agitating.
- ___ Check for pockets of fire or smoldering coffees and extinguish again if necessary.
- ___ **Fire is out of control.**

Disconnect main power supply and call 911 or Fire Department and evacuate all personnel to a safe area away from fire and smoke.

- ___ Fire is completely extinguished, and then proceed to Step-10.

6. Blower Compartment or Ducting Fire

- ___ Locate CO2 Fire Extinguisher
- ___ Turn the Blower "OFF" on Control Panel.
- ___ **Very Carefully** open the blower compartment door.
- ___ Discharge a liberal amount of CO2 into the Blower Compartment. Repeat if required.
- ___ **Fire is out of control.**

Disconnect main power supply and call 911 or Fire Department and evacuate all personnel to a safe area away from fire and smoke.

- ___ Fire is completely extinguished, and then proceed to Step-10.

7. Chaff Collection Department

- ___ Turn the Blower "OFF" on Control Panel.
- ___ Locate water spray bottle and CO2 Fire Extinguisher.
- ___ Very Carefully open the Chaff Collection Compartment Door.
- ___ Discharge a liberal amount water or CO2 into the Chaff Collection Compartment. Repeat if required.
- ___ **Fire is out of control.**

Disconnect main power supply and call 911 or Fire Department and evacuate all personnel to a safe area away from fire and smoke.

- ___ Fire is completely extinguished, then proceed to Step-10.

8. Under the Roasting Drum

- ___ Turn all switches "OFF" at the Control Panel.
- ___ Locate CO2 Fire Extinguisher.
- ___ Open side panel Door.
- ___ Discharge CO2 under the drum that should quickly extinguish any fire in this area.

___ Do not use water in this area

Repeat if required.

___ Fire is out of control.

Disconnect main power supply and call 911 or Fire Department and evacuate all personnel to a safe area away from fire and smoke.

___ Fire is completely extinguished, then proceed to Step-10.

9. Electrical Motors or Electrical Control Panel

___ Disconnect power at main supply; i.e., unplug at outlet or flip circuit breaker at main electrical control panel to "OFF".

___ Locate and discharge CO2 Fire Extinguisher.

___ Repeat if required.

___ Fire is out of control.

Disconnect main power supply and call 911 or Fire Department and evacuate all personnel to a safe area away from fire and smoke.

___ Fire is completely extinguished, then proceed to Step-10.

10. Post Fire Evaluation

___ Completely evaluate all areas for physical damage.

___ For fires that effected electrical components have a certified electrician evaluate the damage.

___ For fires that affected any gas components have a certified gas technician evaluate for damage.

___ Thoroughly clean all areas of your roaster. The majority of fires are caused by a dirty system. Residue and debris buildup is a fuel source.

___ CO2 evaporates quickly. However, we recommend wiping down all surfaces effected with a clean rag. For drum fires roast 2 to 3 full batches of coffee and throw the coffee away.

___ Contact Diedrich Manufacturing Tech Support at 1-877-263-1276-ext 248 to order parts or for general trouble shooting assistance.

Notes:

1. Recommend laminating and posting this checklist near the Roaster.
2. Practice these procedures regularly
3. **Do not PANIC. Panic contributes to a situation getting out of control**