



"The Difference is in the Detail"

DIEDRICH

Catalytic and Thermal Oxidizers

INSTALLATION AND OPERATION MANUAL

READ THIS MANUAL

Important safety, installation, operation and maintenance instructions.

Keep this manual with the oxidizer at all times in a prominent place.

Issued: January 2003

Revised: February 2013

DIEDRICH MANUFACTURING, INC.

P.O. Box 430

Ponderay, Idaho 83852

Telephone: (208) 263-1276

Toll Free: (877) 263-1276

Fax: (208) 265-4584

Copyright © 2013 by Diedrich Manufacturing, Inc.

PROPRIETARY RIGHTS NOTICE: All rights reserved. No part of this material may be reproduced or transmitted in any form or by means, electronic, mechanical or otherwise, including photocopy and recording or in connection with any information storage or retrieval system, without the written permission of Diedrich Manufacturing, Inc..

Contents

PREFACE	2
1.0 IMPORTANT SAFEGUARDS.....	3
2.0 OXIDIZER OVERVIEW	3
3.0 INSTALLATION INSTRUCTIONS	4
3.1 RECEIVING AND UNPACKING SHIPMENT	4
3.2 ASSEMBLING THE OXIDIZER.....	4
3.3 LEVELING THE OXIDIZER	8
3.4 PROXIMITY TO WALLS	8
3.5 EXHAUST DUCTING	8
3.7 SAFETY SHUT-OFF VALVE	10
3.8 PRESSURE REGULATOR.....	10
3.9 GAS INSTALLATION CHECK-OUT	10
3.10 ELECTRICAL INSTALLATION	10
4.0 OPERATIONS	11
4.1 GENERAL	11
4.2 START UP.....	11
4.3 HIGH LIMIT RESET	11
4.4 ADJUSTMENTS	12
5.0 MAINTENANCE AND CLEANING	12
5.1 GENERAL	12
5.2 DIEDRICH CATALYTIC OXIDIZER (DCO) CATALYST REMOVAL.....	14
5.3 CATALYST WASHING	15
6.0 TROUBLESHOOTING	15

PREFACE

Congratulations on your purchase of a new Diedrich Thermal or Catalytic Oxidizer. Your oxidizer was manufactured with the best materials and finest craftsmanship and will provide years of trouble free operation in eliminating smoke and odor. The oxidizer went through a rigorous quality control check and was thoroughly tested at the factory before shipping.

We sincerely thank you for your business.

This owner's manual covers installation, operation, and maintenance as well as important safeguards of your Diedrich Catalytic Oxidizer (DCO) or Diedrich Thermal Oxidizer (DTO). The information contained in this manual reflects procedures on current oxidizer production models.

This manual should remain with the oxidizer at all times and should be located in an easily accessible place. Contact Diedrich Manufacturing if you have any questions about the oxidizer that are not covered in this manual.

Persons operating the Diedrich Oxidizer must be familiar with the safeguards, operation, and maintenance instructions described on the following pages.

1.0 IMPORTANT SAFEGUARDS

Proper installation, cleaning, and safe operation are the owner and operator's responsibilities.

This owner's manual must be kept with the oxidizer at all times and be located in a prominent, easily accessible place. All persons authorized to use the oxidizer must review the manual's contents on a regular basis.

CAUTION – Always be aware of the risk of fire. Fires can be caused by the failure to properly maintain the exhaust ducting system. A dirty exhaust is a fire hazard. We cannot over-emphasize the importance of a safe and clean installation!

Always have a fire extinguisher of proper capacity next to the coffee roasting system. Consult with your local fire marshal for their recommendation of a suitable fire extinguisher.

Never, under any circumstances service this equipment until the oxidizer power supply is de-energized at its electrical source or locked-out and the fuel is shut-off.

During and after the use of the oxidizer, be careful when touching the exterior surface. It will be hot. The bolt heads and exhaust ducting running from the roaster to the oxidizer can become very hot while in operation.

Clean the roaster, intermediate ducting, and exhaust ducting per the roaster and oxidizer operation manuals. The purchase of an oxidizer does not preclude scheduled roaster cleaning.

2.0 OXIDIZER OVERVIEW

The Diedrich Catalytic Oxidizer (DCO) utilizes a catalytic module which is multi-coated with propriety mixtures of precious metals. These coatings provide the active catalytic ingredients, in the presence of heat cause the oxidation of the roasting gases passing over the surface of the catalytic element. In the oxidation process, unwanted VOC's (Volatile Organic Compounds) react with oxygen and produce carbon dioxide and water vapor. There are other trace elements produced, but these are mostly disregarded as being too small in concentration to matter.

Unlike the catalytic oxidizer, the Diedrich Thermal Oxidizer (DTO) does not have catalysts and must achieve higher temperatures to eliminate noxious gases and odors. The internal operating temperature required for pollution and odor abatement is typically set to 1250° Fahrenheit (677° Celsius).

3.0 INSTALLATION INSTRUCTIONS

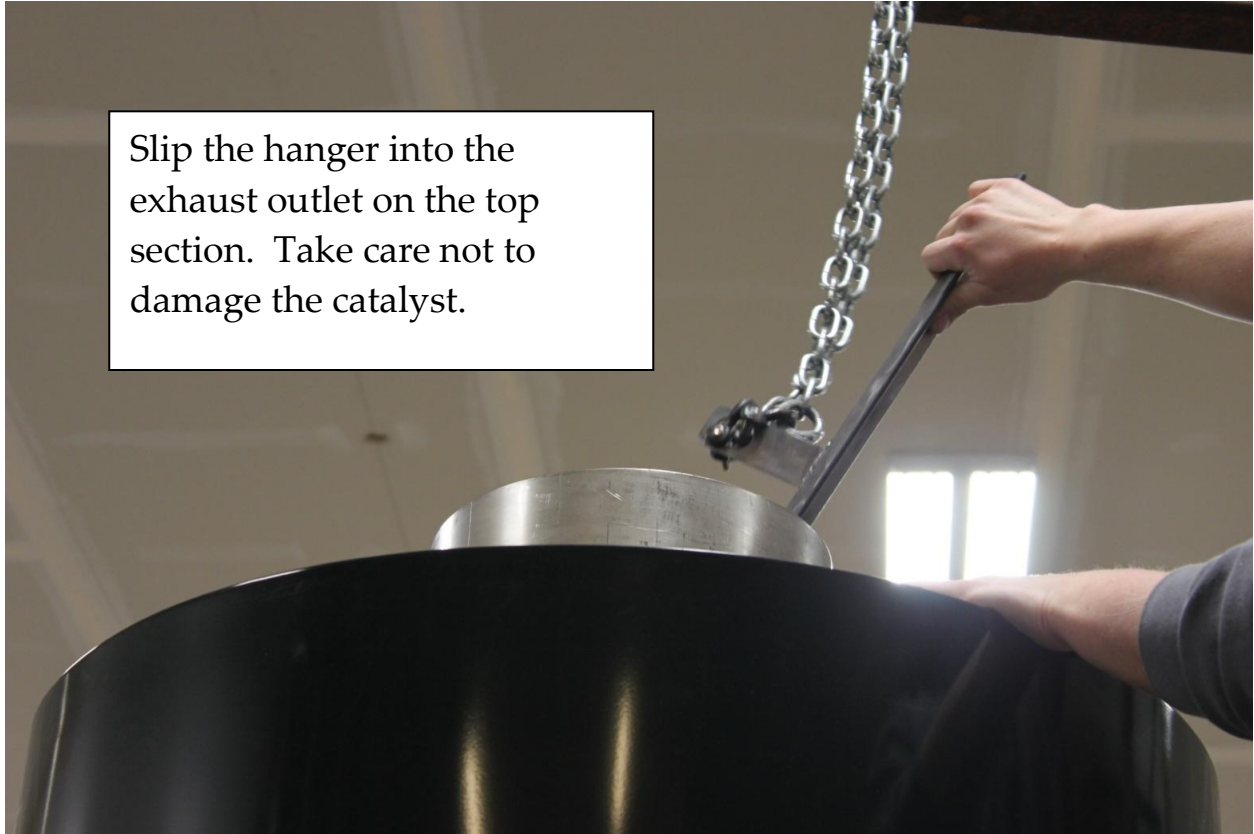
IMPORTANT: The Diedrich Oxidizer is designed and manufactured for ease of installation and simplicity of operation. However, professional installation is required. The installer should read the instructions completely before starting installation to ensure good performance and warranty protection.

3.1 RECEIVING AND UNPACKING SHIPMENT

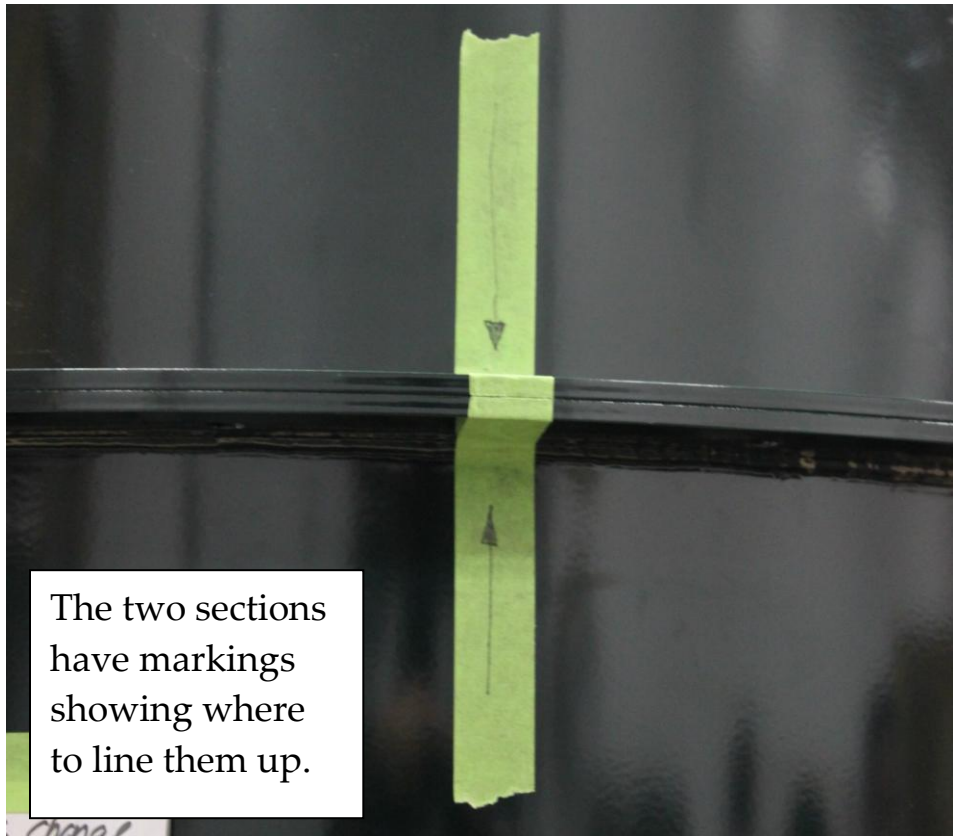
When the oxidizer is received, immediately check for crate damage. Do not refuse shipment if damage is evident. Detail the damage on the appropriate shipping forms. Uncrate and look for damage to the oxidizer, i.e. dents, scratches or chipped paint and if found, immediately file a claim with the appropriate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

3.2 ASSEMBLING THE OXIDIZER

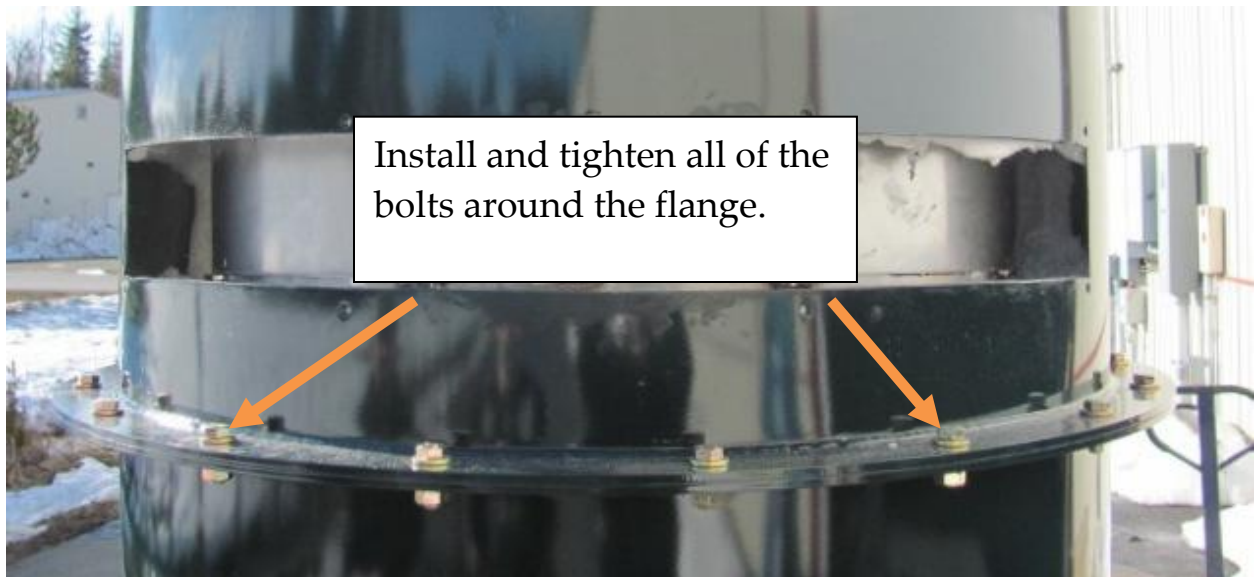
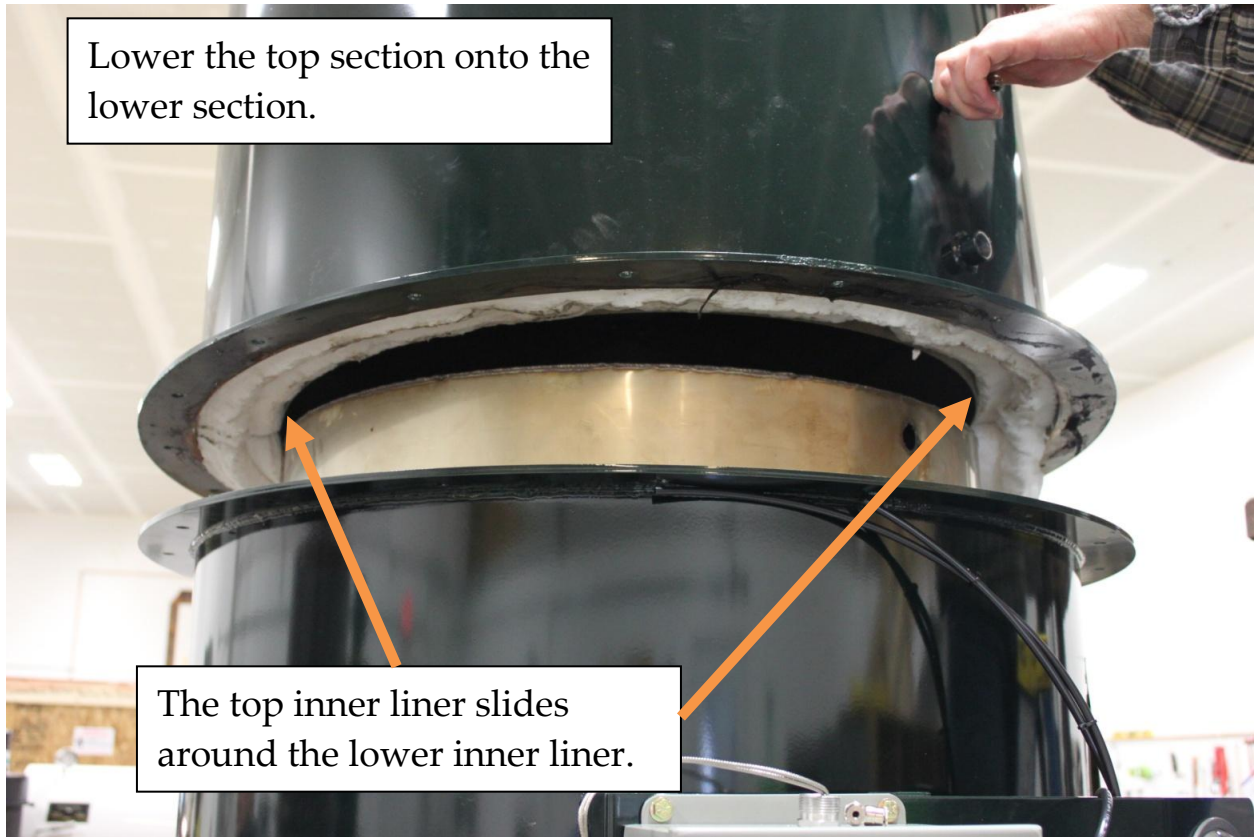
The oxidizer is shipped in two sections and must be assembled. A fork lift or chain hoist is required to place the top section onto the lower section. A hanger bracket (supplied with the oxidizer) is hung from a chain and slipped into the exhaust port of the oxidizer. If it is a DCO take care to not damage the catalyst. The two sections must be bolted together in the correct location and there are a few pieces of tape with arrows to help align the sections. Before fitting the two sections, run a bead of high temperature silicone around the lower flange. When lowering the upper section make sure the top inner liner slides around the lower inner liner. Bolt the two sections together. Install the lower vacuum hose mounting pipe. Press in the vacuum hoses.



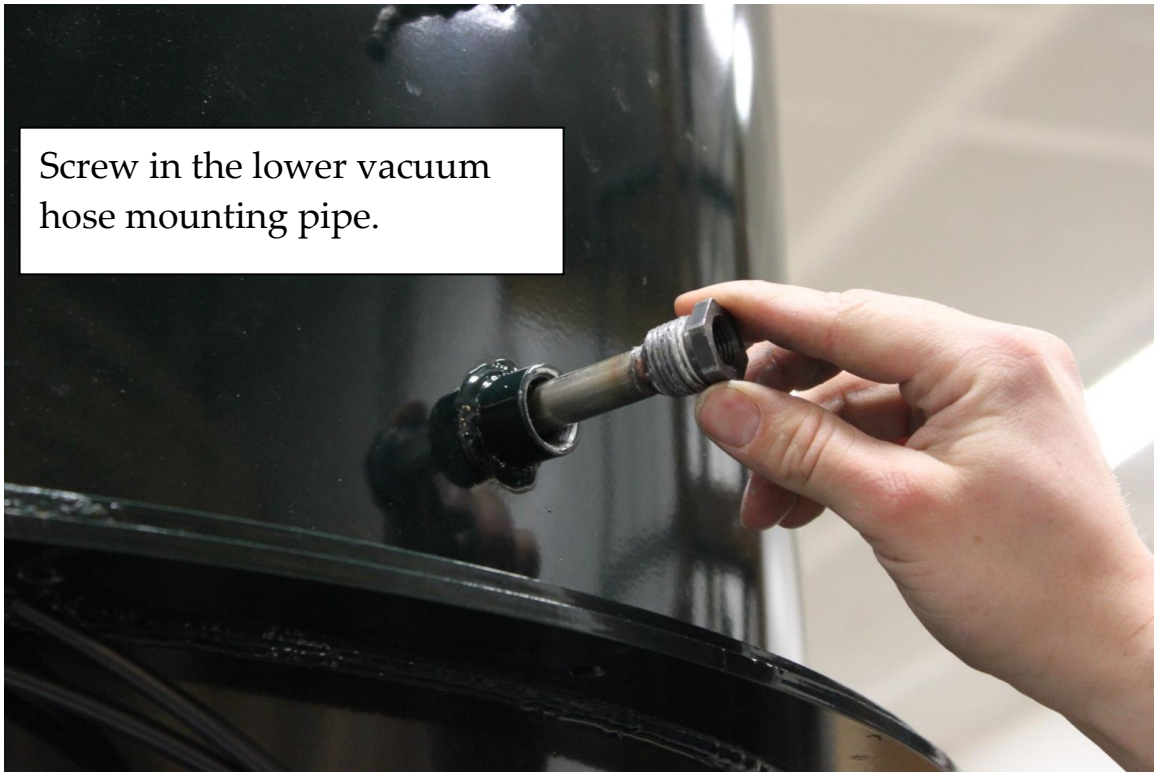
Slip the hanger into the exhaust outlet on the top section. Take care not to damage the catalyst.



The two sections have markings showing where to line them up.



Screw in the lower vacuum
hose mounting pipe.



Push the vacuum
lines into the
fittings.



3.3 LEVELING THE OXIDIZER

The oxidizer must be mounted on a flat, non-combustible surface. A combustible floor requires a fireproof insulation on the areas of the floor below the oxidizer. Typically, stainless steel sheets may be used for this purpose. The non-combustible material must extend a minimum of 24 inches (61 cm) from the front the oxidizer. The floor must meet weight-bearing requirements of the local building codes for commercial buildings.

* Weight varies upon the length of the exhaust stack.

Careful leveling of the oxidizer is critical for performance and safety. It is recommended, the oxidizer be shimmed and bolted to the floor to keep the base stable. This will also allow you to adjust for any irregularities in the floor. The shims used must be non-combustible and corrosion resistant (i.e. stainless steel) as required.

3.4 PROXIMITY TO WALLS

Clearances to combustible or non-combustible walls and counters must be followed to ensure adequate cooling of the oxidizer and adjacent walls. Failure to abide by these clearances will void Diedrich Manufacturing's Warranty.

The minimum clearance from the oxidizer to non-combustible materials is 18 inches (46 cm) and to combustible materials is 24 inches (61 cm). Nothing is to be stored within 24 inches (61 cm) of the oxidizer or its ducting.

DCO only: There must be a minimum of 3 feet (92 cm) of clearance on the catalyst access side of the oxidizer.

Clearances required for positive pressure grease exhaust ducting will vary among manufacturers. The clearances specified by the duct manufacturer should be used as primary guidelines.

Make sure all controls and removable panels on the oxidizer are accessible without restriction.

3.5 EXHAUST DUCTING

The required vent pipe for the oxidizer is **Double Walled Positive Pressure High-Temperature Grease Vent Ducting**. The ducting must be capable of continuous operation at or above 1,400° Fahrenheit (760° Celsius) for Thermal Oxidizers (DTO) and

1100° Fahrenheit (593° Celsius) for Catalytic Oxidizers (DCO). The termination should be equipped with an appropriate weather protective cap. **Anything below this standard is not acceptable and will void Diedrich's Warranty.** Review applicable city, county, state or federal building codes.

The ducting from the roaster to the oxidizer must be suitable for 1,100° Fahrenheit (593° Celsius) continuous and 1,400° Fahrenheit (760° Celsius) intermittent operating temperatures.

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

NOTE: Do not, under any circumstances, allow the weight of the exhaust ducting to be supported by the oxidizer's exhaust outlet. The oxidizer requires independent supports for the ducting.

Ducting should be connected to oxidizer based on the ducting manufacturer's recommendation. Installation of ducting must follow the guidelines set by the ducting manufacturer.

The proper design of the exhaust system is critical to the performance and safe operation of the coffee roaster and oxidizer. The ducting must be of sufficient diameter to accommodate the ACFM (actual cubic feet per minute) or ACMH (actual cubic meters per hour) of airflow. The system should be designed to create no more than 0.2 inches W.C. (.5 mbar) internal static pressure for proper airflow. Restricted airflow keeps the oxidizer from operating properly and will produce a less than desirable coffee quality. **Consult with a local mechanical engineer or a positive pressure vent-ducting manufacturer.**

A faulty design of the exhaust ducting system can result in restricted airflow, which can cause premature residue build-ups in the coffee roaster and the associated ducting system.

3.6 GAS INSTALLATION

NOTE: USE A LOCALLY LICENSED HEATING CONTRACTOR OR YOUR LOCAL GAS COMPANY FOR THE GAS LINE INSTALLATION.

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

The gas supply line must be adequate for the gas flows required by the oxidizer. All pipe used for the installation must be at least schedule 40 black iron pipe (do not use galvanized). Sealant used on pipe joints must be resistant to liquid propane. A water trap to collect condensation and loose particles should be installed in the last horizontal gas supply line upstream of the Oxidizer.

The supply line to the oxidizer must deliver the maximum volume and pressure specified in the burner manufacture specification sheet.

3.7 SAFETY SHUT-OFF VALVE

A safety shut-off valve is installed in the oxidizer's supply line from the factory. In an emergency the operator can turn off the gas flow to the Oxidizer.

3.8 PRESSURE REGULATOR

A pressure regulator is installed on the incoming gas supply line from the factory as specified by the customer (natural gas or LP).

3.9 GAS INSTALLATION CHECK-OUT

Always have a qualified gas technician check connections for gas leaks with a soapy water solution or other acceptable method before placing the oxidizer in operation. **DO NOT USE AN OPEN FLAME TO CHECK FOR GAS LEAKS!** During any pressure testing of the gas supply line the oxidizer must be isolated from the gas supply line by closing its safety shut-off valve.

3.10 ELECTRICAL INSTALLATION

USE A LOCALLY LICENSED ELECTRICIAN FOR THE ELECTRICAL CONNECTIONS.

The oxidizer must be installed in accordance with local codes or in their absence, the latest edition of the National Electrical Code.

Do not operate the roaster/oxidizer combination without the oxidizer fully operational. The roaster will leave a heavy residue build-up in the oxidizer, catalyst, and exhaust system if it is operated without the oxidizer running. This creates a severe fire hazard when the oxidizer is subsequently operated. This will void the manufacturer's warranty and release Diedrich Manufacturing, Inc. of any liability thereof.

4.0 OPERATIONS

4.1 GENERAL

Coffee does not emit smoke until it reaches a temperature above 270° Fahrenheit (132° Celsius). Diedrich Oxidizers are designed to begin operating when the roaster attains an operating temperature of 250° Fahrenheit (121° Celsius). The oxidizer will then rise to the appropriate operating temperature.

Note: Coffee still emits smoke while it is cooling in the cooling bin.

4.2 START UP

There are 3 styles of control for Diedrich Oxidizers.

1. Automated roaster: Our Zenyth automation sends a signal to turn on the oxidizer. The oxidizer temperature is shown on the automation screen. The oxidizer burner turns on and goes to low fire when the roaster is lit. Once a roast is started (timer counting), bean temperature is above 250°F (set in owner options), and over 2.5 minutes into the roast for the burner to go to high fire.
2. Manual roaster: Oxidizers attached to our current manual roasters will turn on from the signal sent by the roaster. The oxidizer temperature is shown on the digital display mounted on the electrical panel. The oxidizer burner turns on and goes to low fire when the roaster is lit. The burner goes to high fire once a roaster is above 250°F.
3. Stand alone: Oxidizers not wired into a roaster are started with the switches mounted on the electrical panel. The oxidizer temperature is shown on the digital display mounted on the electrical panel.

4.3 HIGH LIMIT RESET

All Oxidizers are fitted with a hardware high temperature limit module. The gas will shut off if the oxidizer temperature rises above the set point. This temperature set point is 1,000°F (538°C) for a DCO or 1,450°F (788°) for a DTO. The module needs to be manually reset before the oxidizer will light again. It can only be reset after the

temperature drops below the high limit set point. Manual and stand alone oxidizers have a reset switch located on the electrical panel. Automated roasters have a high limit reset button on the user operations screen.

If the gas does not shut off when temperatures over the set point are reached, the gas should be manually shut off and the high limit inspected for failure. Temperatures over 1,000°F (538°C) may damage the catalytic module.

Warning! Never operate the oxidizer with the fixed high limit switch disconnected or inoperable in any way.

4.4 ADJUSTMENTS

Contact Diedrich Manufacturing, Inc. technical support at (877) 263-1276 or (208) 263-1276 ext 244 before making any adjustments to the oxidizer's preprogrammed temperature settings or burner assembly.

5.0 MAINTENANCE AND CLEANING

5.1 GENERAL

CAUTION! Do not touch or work on the oxidizer until it has cooled below 100°F or (38°C).

The oxidizer itself is relatively maintenance-free. However, the ducting leading into the oxidizer from the roaster needs to be cleaned before the exhaust residue accumulates to more than 1/8" (2mm). The ducting from the oxidizer to the termination on the outside of the building is maintenance-free but should be checked at least every six (6) months for structural integrity and safety purposes.

NOTE: A dirty airflow system increases the risk of **FIRE**.

Improper or lack of cleaning the exhaust system will lead to a **SEVERE FIRE HAZARD**. 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 ducting than a hot, dry climate. Moist climates create severe condensation, as will coffees with excessive moisture. This moisture will adhere to the exhaust ducting causing more build-up.

The burner manufacturer's manual contains information about burner maintenance.

A marked decrease in DCO performance may indicate the catalyst module has become clogged. The clogging may be caused by one or a combination of the following:

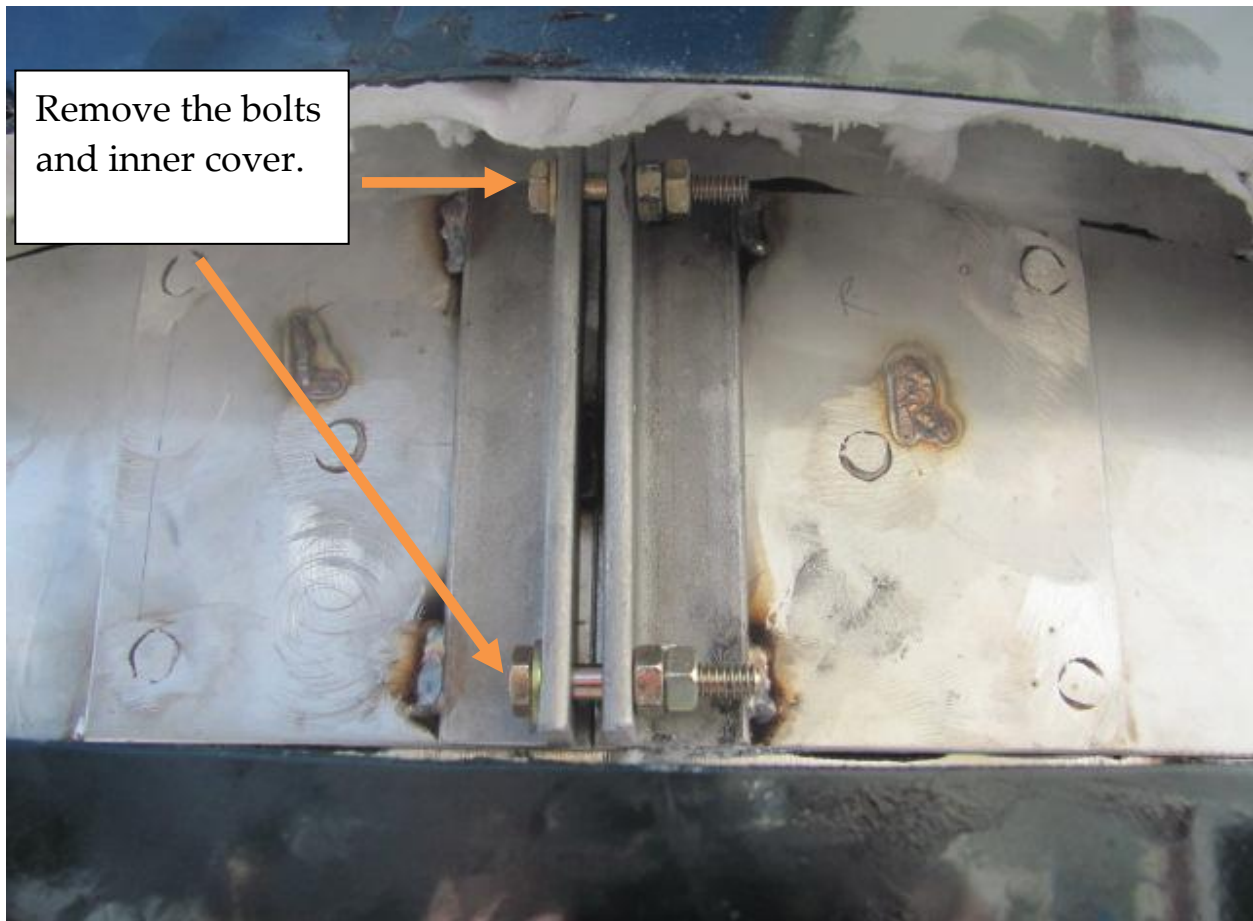
1. The catalyst module is not reaching the proper temperature.
2. The coatings are losing their effectiveness.
3. The burner is not lighting.
4. The catalyst has become clogged with chaff typically due to a dirty roaster.

When the dial on the Magnehelic, located on the side panel of the oxidizer, goes above 0.5" in pressure this is an indication that the catalytic module is clogging. If the needle rises to 0.8" the gas will shut off.



5.2 DIEDRICH CATALYTIC OXIDIZER (DCO) CATALYST REMOVAL

The oxidizer is insulated with fiberglass and proper protective clothing, respirators, eye protection, and ventilation must be used when removing the catalyst. The catalyst is located in the top section of the oxidizer. Remove the bolts holding the cover on. The cover is sealed with silicone and will need to be pried off. Carefully remove the insulation behind the cover. Remove the bolts securing the inner liner cover. Each piece is clipped to a tab at the other end. Slide the cover over and off of the tab. Once the covers are removed slide the catalyst out. Installation is the reverse of removal.



5.3 CATALYST WASHING

The washing procedure for the catalytic foil can be performed in three simple steps. Since the majority of the compounds deposited on the catalyst are water soluble, plain water should be used. However, care must be taken to use only **clean hot water**. Soap, detergents, bleaches, anti-oxidants, and other normally approved commercial cleaning agents all contain substances which are considered catalyst poisons, and if used, would damage the converter, make it inoperable, and void any warranty. Further, do not run the catalyst through any type of automatic or vibratory washer, such as those found in restaurants, as this might physically damage the catalyst surface.

Clean all foreign matter from any wash basin used, before starting the catalyst washing process, which is as follows:

- a. Fill a clean plastic or metal container or basin, that is large enough to accommodate the catalyst foil, with enough clean hot water (100-130° F) to completely cover the catalyst foil when placed into the basin. A children's plastic pool works well for this. Agitate the catalyst foil several times up and down in the water and then let it soak for 20 minutes.
- b. Remove the catalyst and shake out the excess water. Drain and clean the basin thoroughly and then repeat the first step until the catalyst is clean.
- c. Rinse the catalyst thoroughly with a large volume of hot water. A garden hose with a spray nozzle is perfect for this operation. Work the spray slowly over the entire surface both front and back to assure the removal of any particles caught in the converter face or behind the converter frame. Shake the remaining water from the catalyst foil and then let air dry overnight. Please note that the oxidizer should not be used until the catalyst is dry.

If the module is thoroughly clean and the desired internal temperatures are present and smoke/odors appear, then this indicates that the module is nearing the end of its life cycle and requires replacing.

6.0 TROUBLESHOOTING

Make certain all of the startup requirements have been met. The oxidizer is fitted with an Eclipse Veri-Flame ignition control module. There are LEDs on the module which are great troubleshooting resources. Refer to the Veri-Flame manual supplied with the oxidizer for the meaning of the LEDs.