



# DR-25

## Installation & Operation Manual

**Please read all sections of this manual and retain for future reference.**



IOM-DR25-0001, Rev. 004  
2023

Diedrich Roasters LLC, 850 Hawthorne Ave., Ponderay, ID 83852  
Toll Free: (844) 343-3742  
Technical Support: [support@diedrichroasters.com](mailto:support@diedrichroasters.com)

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 Roasters, LLC.

Original Instructions

# 1 Table of Contents

<b>1 SAFETY .....</b>	<b>3</b>
<b>2 INSTALLATION INSTRUCTIONS.....</b>	<b>6</b>
2.1 RECEIVING EQUIPMENT .....	6
2.2 UNCRATING EQUIPMENT .....	7
2.3 POSITIONING / LEVELLING THE ROASTER AND CYCLONE .....	10
2.4 GREEN BEAN HOPPER .....	12
2.4.1 <i>Green Bean loader (Optional)</i> .....	13
2.4.2 <i>Loader Vacuum motor Installation</i> .....	14
<b>3 UTILITY CONNECTIONS .....</b>	<b>17</b>
3.1 GAS CONNECTION .....	17
3.1.1 <i>Safety Shut-Off Valve</i> .....	17
3.1.2 <i>Gas Pressure Regulator</i> .....	17
3.1.3 <i>Water trap</i> .....	17
3.1.4 <i>Pipe Sizing</i> .....	17
3.1.5 <i>Gas Conversion Instructions (Optional)</i> .....	18
3.1.6 <i>Maxitrol Tuning:</i> .....	22
3.1.7 <i>Staged Burner Percentage</i> .....	22
3.2 WATER CONNECTION .....	23
3.3 ELECTRICAL CONNECTIONS .....	24
3.3.1 <i>Main Electrical Panel - Incoming Power Connection (lower left access door)</i> .....	24
3.3.2 <i>Motor / Ancillary Connections</i> .....	25
3.4 DUCTING .....	26
3.5 INSTALLATION INSPECTION .....	27
<b>4 OPERATION .....</b>	<b>27</b>
4.1 INITIAL START-UP / SHUTDOWN (REFER TO THE AUTOMATION MANUAL) .....	27
4.2 POWER LOSS/OUTAGE .....	27
<b>5 ROASTING .....</b>	<b>28</b>
5.1 SEASONING THE DRUM.....	28
5.2 ROASTING FOR CONSUMPTION.....	29
<b>6 DESTONER OPERATION (OPTIONAL) .....</b>	<b>31</b>

# 1 SAFETY

## Responsibility

**Before attempting to clean or service your unit, read the instructions in this manual thoroughly.**

**Responsibility for health, safety, accident, and environmental regulation falls to the operator. All personnel working in proximity to the roaster should be trained on all instructions and safety precautions. Despite all warnings and labeling, the operator incurs some risk in operation. It is imperative that the operator use caution while the machine is in use. Surfaces become hot to the touch and moving parts are accessible while in operation. Keep hands and loose articles of clothing away from heat and all moving parts.**

Warranty is void unless product is installed and used in accordance with all written instructions.

Do not remove any labels, warnings, or rating plates from the roaster or from its components as this may void manufacturer's and Diedrich Roaster's warranties.

To prevent electrical shock and injury, all access doors should remain locked, unless the roaster has been properly locked out and service is being performed.

Products roasted in Diedrich roasters are not intended for direct consumption. As such, products to be consumed following the roasting process should be prepared in accordance with local health standards. Contact the local health department for details on these requirements.

*Disclaimer: Diedrich Roasters, LLC is not liable for machinery use not covered in this document, the employment of untrained personnel or alterations and changes made to the machinery and/or systems.*

## Misuse

The operator is responsible for proper use of the equipment – roasting and cooling coffee. Improper use can result in safety concerns. Improper use may include, but is not limited to:

- Using the equipment for any product other than coffee, without the approval of Diedrich Roasters, LLC.
- Operating outside the limitations of the roaster (temperature, max batch capacity, electrical rating etc.).
- Modifications to the roaster or systems.
- Use by untrained personnel.
- Unsafe work practices, ignoring listed safety precautions.
- Removal of warning labels and/or safety devices.
- The use of unauthorized spare parts.
- Operating without awareness of risks and taking proper precautions.
- Equipment being improperly installed or operated in a potentially explosive environment.

## Dangers, Warnings, and Cautions

**Throughout this manual, you will find notations enclosed in bordered boxes similar to the ones below.**

The following safety indicators are found on the roaster, to identify potential hazards.



**DANGER: Electric shock and/or hazard risk.**



**WARNING: Pinch point. Keep hands clear during operation.**



**CAUTION: Hot surface. Do not touch.**



It is recommended that the use of hearing protection be implemented when operating the machine, as the following airborne noise emissions have been observed during operation:

- a) Maximum A-weighted: 73.5 dBA,
- b) Maximum C-weighted: 75.7 dBC

The operator should use caution when working around the roaster during operation, as some surfaces become hot and could cause physical harm. Areas to pay particular attention to include, but are not limited to:

- The drum
- The faceplate
- Exhaust
- Chaffe collector enclosure
- Roast air cyclone

Throughout this manual, the following signal words are used to identify the degree of seriousness in any operation that presents a potentially hazardous situation.



**DANGER:** Indicates a hazard that ***WILL*** cause severe personal injury, death, or substantial property damage if ignored.



**WARNING:** Indicates a hazard that ***COULD*** cause severe personal injury, death, or substantial property damage if ignored.



**CAUTION:** Indicates a hazard that could cause **MINOR** personal injury or property damage if ignored.



**ATTENTION:** Indicates an instruction that should be followed.



**Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.**



**Keep the area around the roaster free and clear from combustibles and maintain a minimum of 18-inches clearance around the roaster at all times.**



**Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.**



*Work on the electrical system should be carried out by qualified personnel only. All power should be shut down and locked out prior to maintenance.*



*Avoid contact with hot surfaces.*



*Always be aware of the risk of a fire. Fires are caused by failure to maintain a clean roaster and its exhaust duct system. Immediately turn off the burners if there is any indication they are not functioning properly.*



*If there is any indication of fire, immediately turn off the gas line, turn on the quench and ventilate the room.*



*Instructions to be followed in the event the operator smells gas or otherwise detects a gas leak must be posted in a prominent location. This information can be obtained from the local gas company or gas supplier.*



*A fire extinguisher should be located close to the roasting system. Consult with your local fire department for recommendations on suitable fire extinguishers.*



*This roaster is intended for professional use only and is to be operated by qualified personnel only. **Never permit an unqualified person to operate the roaster.***



*ALWAYS disconnect roaster at electrical source (at the circuit breaker or safety shut-off switch) before servicing.*



*Proper installation, cleaning, and safe operation of the coffee roaster are the owner and operator's responsibility.*

## 2 INSTALLATION INSTRUCTIONS



*Professional installation is required. Your Diedrich Roaster is designed for ease of installation and simplicity of operation. **Read these instructions completely before starting installation.** Your local building authority should be contacted to obtain local codes and installation requirements before installing your roaster.*



*The completed roaster installation **MUST BE INSPECTED** for compliance to codes and by your local fire department **PRIOR TO OPERATING THE ROASTER.** Failure to have these inspections performed will void the warranty and will relieve Diedrich of any liability associated with the installation and use of our products.*



### 2.1 Receiving Equipment

Upon receipt of your roaster immediately check for crate damage. On larger roasters, there is a “tip tell” indicator shown below in the upper right corner of the crate. Do not refuse shipment if damage is evident. Make notes of damage on the appropriate shipping forms and take photos. 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. **Prepare to have several capable people/tradesmen, a forklift, and a pallet jack (5' long minimum) to be available based on the weight stated in the Roaster Guide.** Stage the roaster close to the desired location for uncrating.





## 2.2 Uncrating Equipment



**The Roast Air Cyclone should be the first crate to be un-packed and placed as the cyclone exhaust will align with the building exhaust ducting.**

Using a T25 Torx driver / screw gun, remove the top and 4 sides of the crate. Carefully remove the shrink wrap and paper from the roaster. Remove the screws that secure the cyclone to the pallet. Use several people to lift off the pallet and place in the desired location (see section 2.4 Positioning the Roaster).



Connect to building exhaust ducting



Next, un-pack the roaster crate...

Using a T25 Torx driver / screw gun, remove the top and 4 sides of the crate.

Carefully remove the shrink wrap and paper from the roaster. Remove the wrapped ancillary components located in the cooling bin and also fixed to the pallet. Set aside for the moment...



Locate the (4) outside corner fasteners at the base of the roaster. Using a  $\frac{1}{2}$ " socket and wrench, **remove the fasteners** that secure the roaster to the pallet. You will have to reach under the pallet to hold the bolt head.

Using a T25 Torx driver / screw gun, remove the fasteners ● that secure wood support stand for the computer monitor.







*The roaster now has to be raised to accept a forklift for removal.*

Using a  $\frac{3}{4}$ " socket with impact or air tool, rotate the (4) levelling feet (clockwise) **EVENLY** from front to rear to **raise** the roaster to its maximum level.



**Failure to rotate evenly could result in the roaster tipping over. Have several people available to assist with this!**



Use the appropriate forklift to lift the roaster up and remove the pallet. Using the forklift or low-profile pallet jack, locate the roaster to desired location (see section 2.3 *Positioning the Roaster*).

## 2.3 Positioning / Levelling the Roaster and Cyclone

The roaster and cyclone *must* be placed on a flat, non-combustible floor and meet weight-bearing requirements of local codes. Refer to the **Roaster Guide** specifications chart for floor bearing weights.

Place the roaster where operation and coffee roasting can be observed in natural light or under consistent light conditions. Natural light is essential for best results when observing the true color changes coffees undergo during roasting. The use of a full-spectrum fluorescent light to simulate the full color of sunlight is recommended for consistency in roasting.

If you have an afterburner, position that first to align with the exhaust stack. Work your way from rear to front assembling ducting and final connections to the roaster. Refer to the **Roaster Guide** for proximity to walls, etc.



**Clearance from the roaster to adjacent walls, counters or other appliances must be at least 18-inches (46 cm) or greater to ensure adequate cooling of the roaster and adjacent walls.**

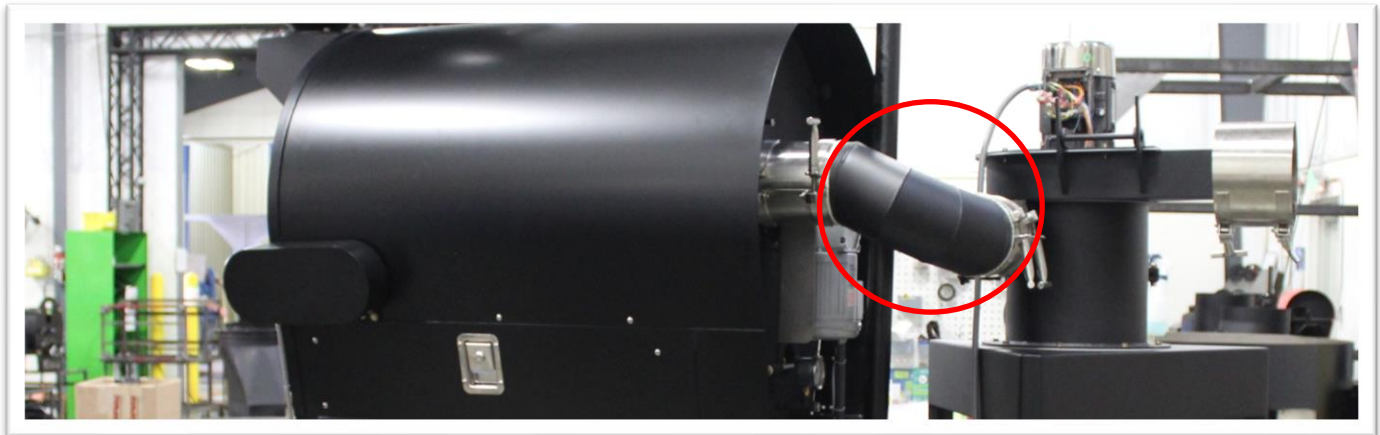


Failure to abide by required clearances will void your Diedrich warranty. No cabinets or storage areas are to be installed over the roaster or near the ducting.



Make sure all controls, access doors, and inspection panels are accessible and can be opened without restriction.

With the roast air cyclone in place, move the roaster close to the cyclone. Locate the short intermediate duct that connects the roaster exhaust to the cyclone inlet. Connect one side of the duct to the cyclone and align the roaster as close as possible (be aware the roaster is still raised to its maximum position so the roaster will be several inches higher).



Next, with the forklift removed and the roaster roughly positioned, the roaster must be lowered to the floor level.

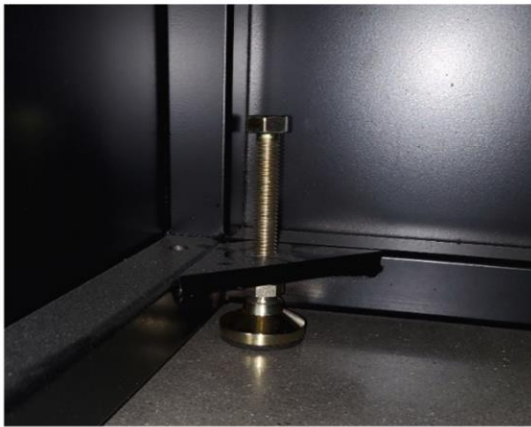
Use a  $\frac{3}{4}$ " socket with impact or air tool, rotate the (4) levelling feet (counter-clockwise) **EVENLY** from front to rear to **lower** the roaster to its minimum level.



**Failure to rotate evenly could result in the roaster tipping over. Have several people available to assist with this!**

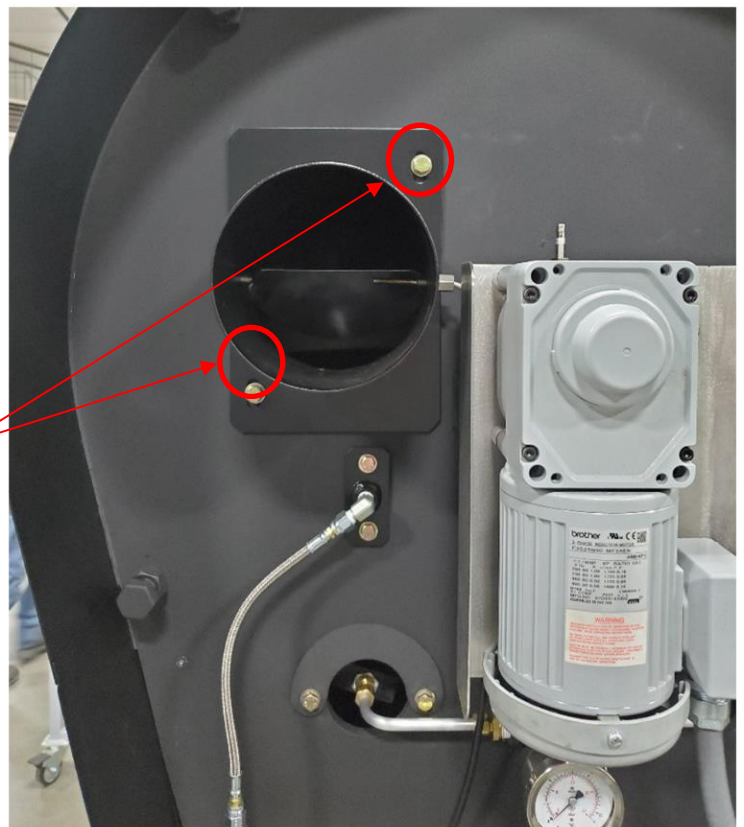


Careful levelling of the roaster is critical not only for performance but for alignment of the roasting drum. Using a carpenter's level, check front to rear and side to side using the cooling bin as a reference. Adjust the (4) legs with a  $\frac{3}{4}$ " wrench / socket to achieve the proper level.



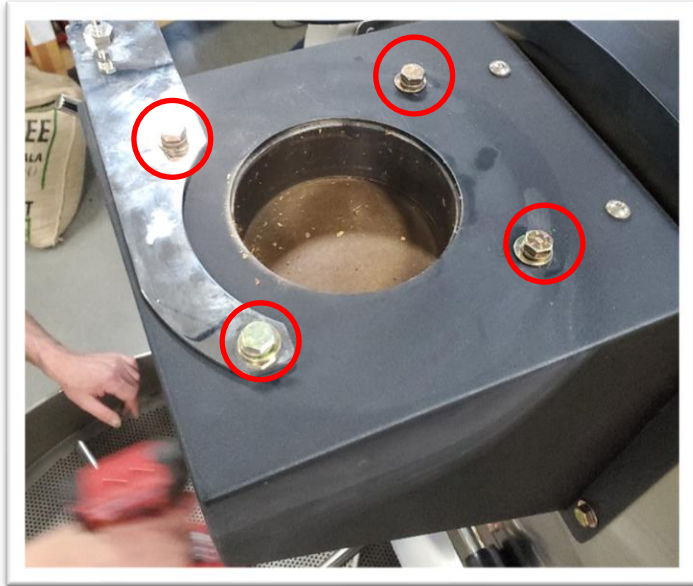
With the roaster now level, final intermediate duct height alignment can be achieved by raising or lowering the roaster exhaust flange.

Using a  $\frac{1}{2}$ " socket or wrench, slightly loosen the (2) bolts that secure the exhaust flange to the roaster. Slide the flange up or down for fine adjustment of the duct. Firmly re-tighten.



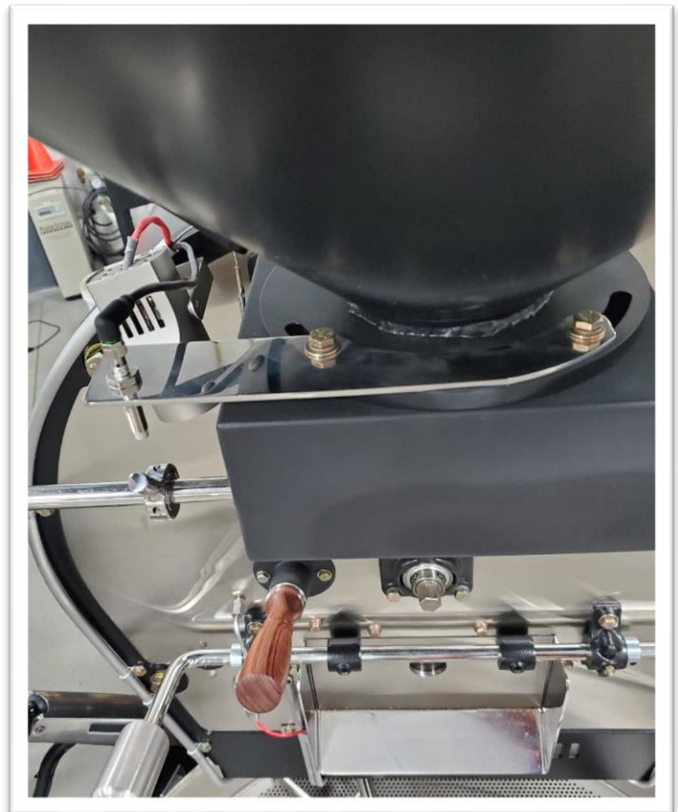


## 2.4 Green Bean Hopper



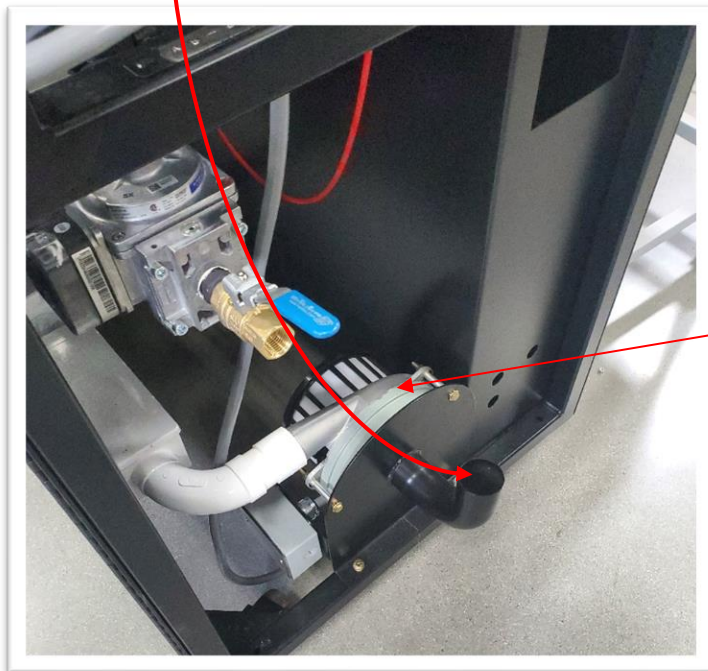
Using a 7/16" wrench, temporarily remove the (4) bolts and bracket shown from the front air hopper

Hoist the green bean funnel on top of the air hopper and replace the (4) bolts and bracket as shown. Tighten firmly.



### 2.4.1 Green Bean loader (Optional)

Locate loader suction tubing and connect with supplied tubing clamps.  
Connect flexible tubing from load cart to green bean hopper inlet.



**Loader Motor**



#### 2.4.2 Loader Vacuum motor Installation

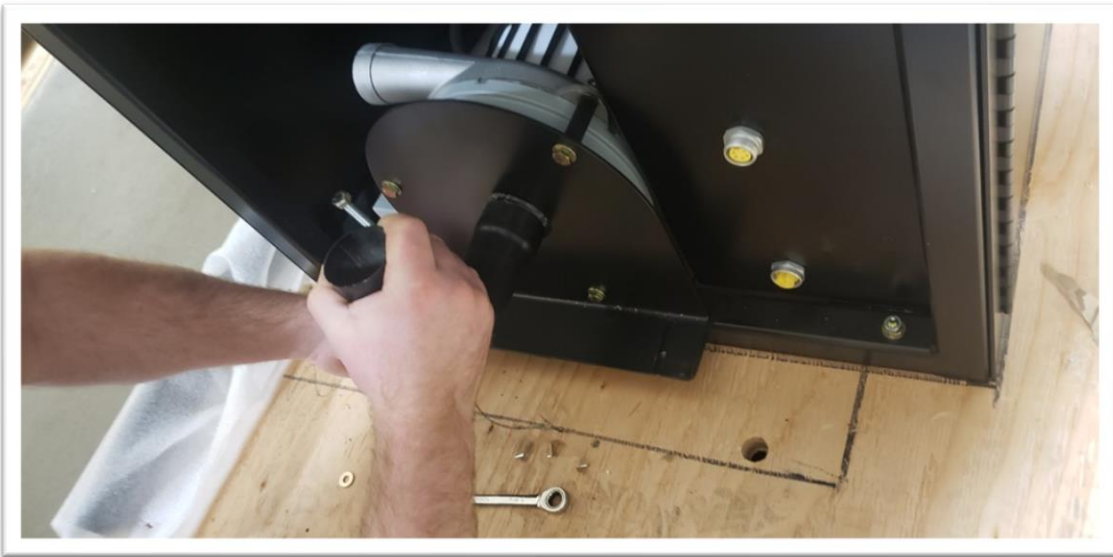
1. Remove ¼" nuts from the bottom of the loader vacuum motor mount using a 7/16" wrench / socket.



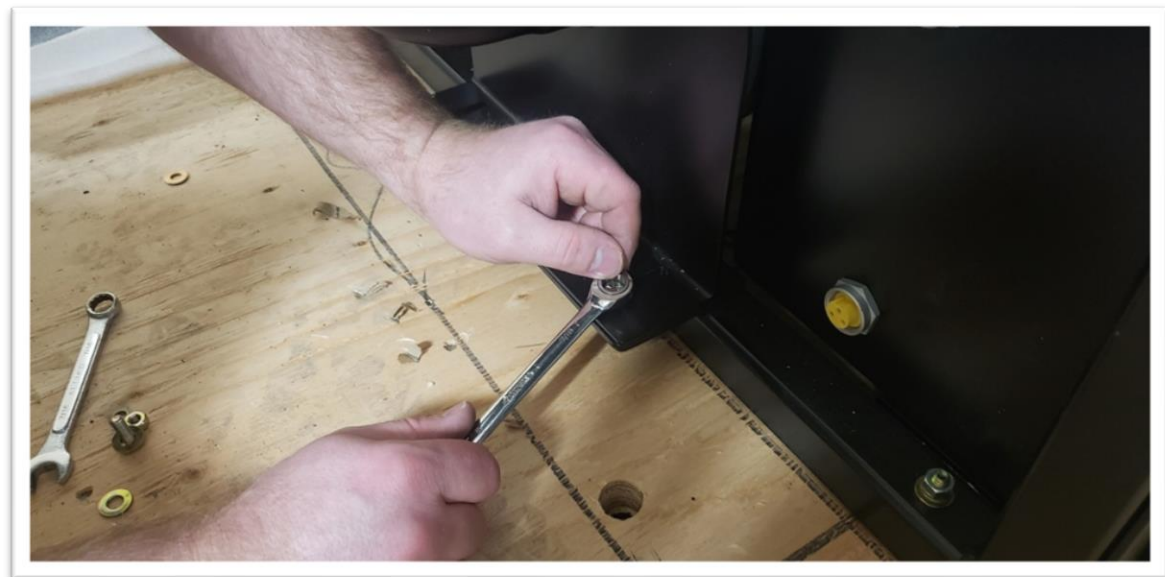
2. Remove the ¼" bolts from the top of the loader vacuum motor mount using a 7/16" wrench / socket.



3. Set loader vacuum motor on the mount and align.



4. Secure loader vacuum motor with  $\frac{1}{4}$ " bolts and a flat washer using a  $\frac{7}{16}$ " wrench / socket.



5. Install nuts, lock washers, and flat washers on the bottom of the bolts securing loader vacuum motor using a 7/16" wrench / socket.



6. Install the 3-prong cord connected to the loader vacuum motor to the 3-prong socket at the rear.



## 3 UTILITY CONNECTIONS

### 3.1 Gas Connection



Refer to the **Roaster Guide** for Equipment specifications **Use a licensed gas company for the gas installation.** Gas installation **MUST** conform to local codes, regulations, and/or laws.

#### 3.1.1 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 case of an emergency. The shut-off MUST be marked to identify it as the gas shut-off.**

#### 3.1.2 Gas Pressure Regulator



**IF the building pressure is higher than the maximum gas rating of the equipment, a separate incoming pressure regulator MUST be used.**

#### 3.1.3 Water trap



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

#### 3.1.4 Pipe Sizing



The gas supply line **MUST** be sized to accommodate the total length of the run and to accommodate any required elbows. The gas pipe **MUST** be no less than the roaster's inlet size

**Sizing of the gas supply line is critical to the roaster performance. Ensure the gas supply line is sized in accordance with the maximum BTU/hr and inlet gas pressure demands of the roaster and any other appliances connected to the gas line.**

**IMPORTANT:** When the gas installation is complete, have your gas technician 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.



**\*\* Once gas line is connected and turned on, the min gas pressure switch must be RESET\*\***

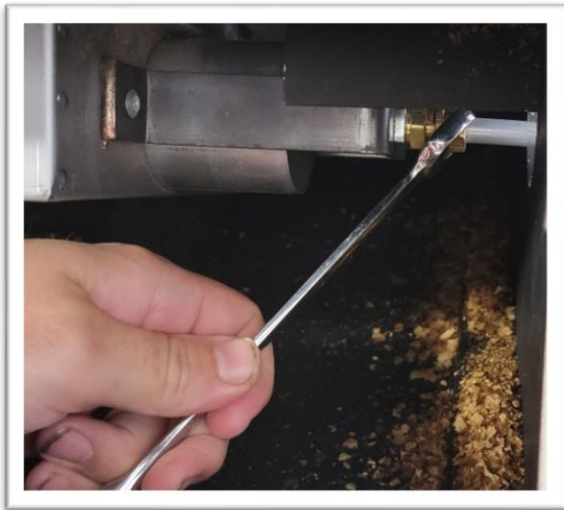
### 3.1.5 Gas Conversion Instructions (Optional)

**These instructions are for roasters equipped with Maxitrol gas valves**

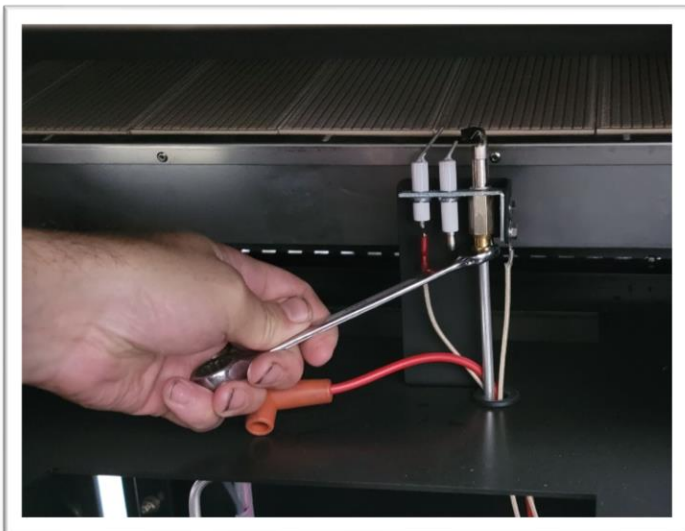
**Tools Recommended:**

- #2 Philips Screwdriver
- 5/8" Wrench
- 7/16" Socket
- 1/2" Socket
- 1/2" Wrench
- 7/16" Wrench
- Parts required: Correct LP or Nat Gas Conversion Kit

1. Turn off gas and disconnect power to the roaster.
2. Open the right-side burner compartment door.
3. Remove right side burner only to access the pilot assembly.
4. Loosen the brass fitting with a 5/8" wrench and slide the burner to the left and then straight out to remove the burner.

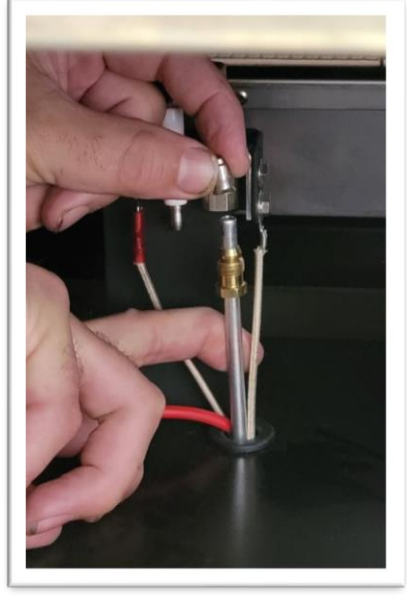
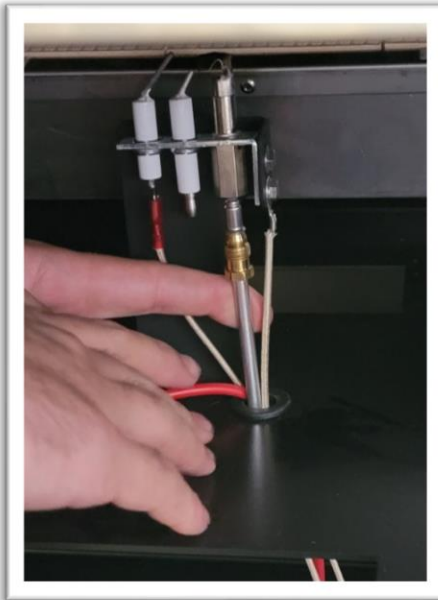


5. Using a 1/2" wrench, loosen the brass nut and gently separate the pilot "T" from the gas line and change the bell-shaped gas orifice located in the brass compression fitting.

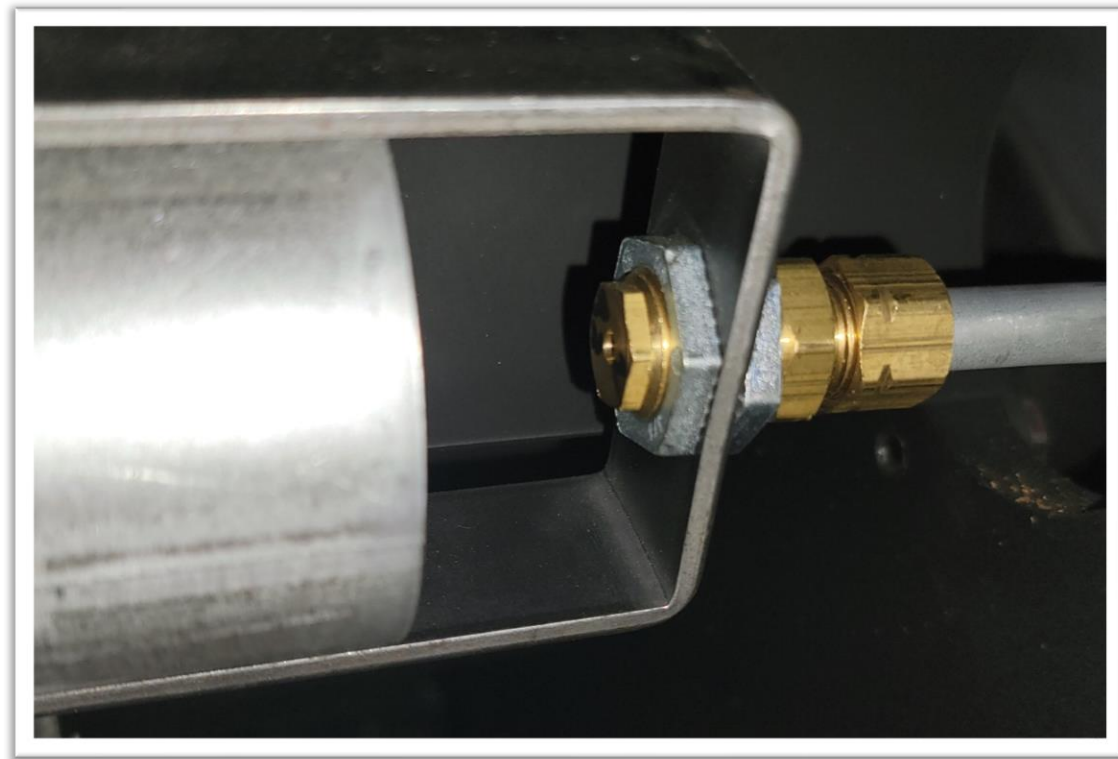




6. With the new pilot orifice in place, reverse the procedure to tighten the gas line to the pilot tee, and install the burner back into the roaster. Make sure all fittings are seated and tightened properly.



7. Using a  $\frac{1}{2}$ " wrench, remove and replace both burner orifices with the new gas type - the orifice is screwed into the brass fitting

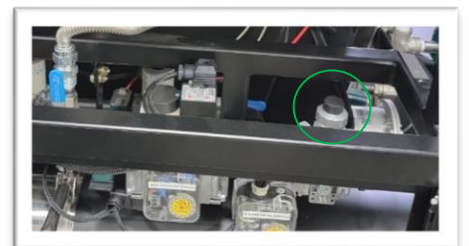


8. Open the lower right rear door to access the gas train area.
9. Using a screwdriver, remove the clear cover of the pilot, minimum and maximum pressure switch covers.
  - Depending on the gas train certification on your roaster (ETL/CSA) or (CE/AGA), the pressure switches will indicate different settings referencing pressure:
    - ETL/CSA = INWC (inches of water column)
    - CE/AGA = MBAR (Millibar)
10. Using the gas train charts below, move/set the pressure switch dials to match the charts with the gas type you are using (NG or LPG).

**Note:** *PS1=minimum switch, PS2=maximum pressure switch, PS3=pilot pressure switch*



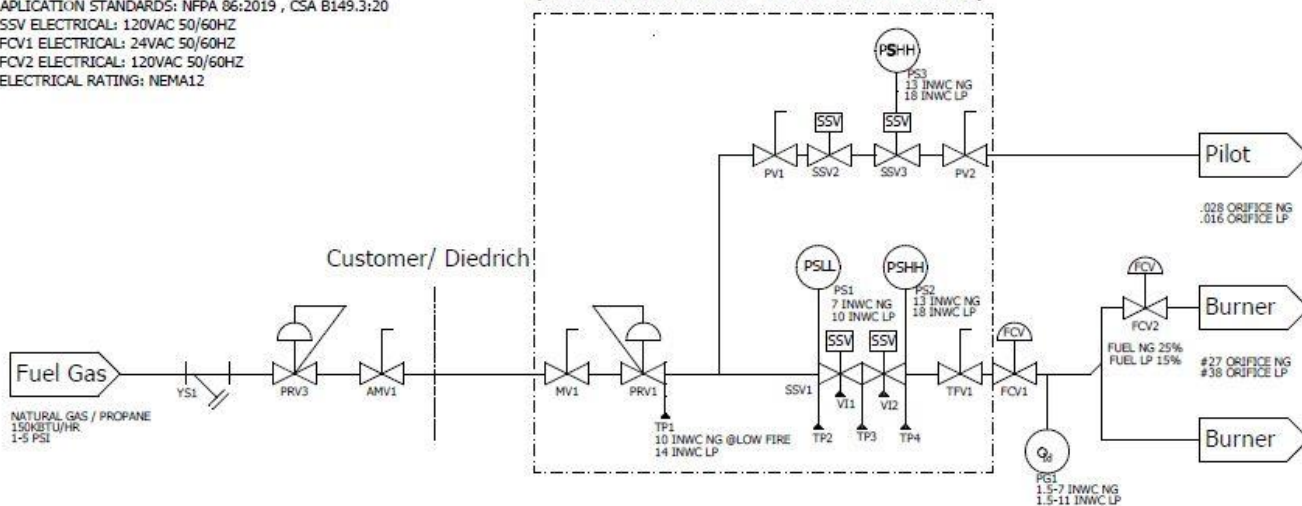
11. Reconnect power and turn on gas.
12. Check for any gas leaks. Spray a heavy soapy water mixture on any gas fittings that were loosened during the gas conversion. Look for gas leaks. Indications of gas leaks will be evident by the soapy mixture "bubbling" as it is applied to the gas fittings. Retighten gas fittings as required.
13. Using the test port (TP1), measure the gas pressure and adjust the regulator (PRV1) to obtain the new incoming gas pressure to correspond with the gas type on the gas train charts below.
  - a. To adjust, unscrew the black protective cap. Turn the screw clockwise to increase pressure / counterclockwise to decrease.
14. Follow the Maxitrol Tuning strategy below to tune the gas valve for the new gas type.



GAS P&ID'S BELOW ARE FOR REFERENCE ONLY. FOR THE MOST CURRENT VERSION SEE SCHEMATICS SENT WITH THE ROASTER OR CONTACT DIEDRICH.

MAXIMUM PRESSURE RATING: 5 PSIG  
 MINIMUM/MAXIMUM INLET PRESSURE: 1-5 PSIG  
 GAS TYPE: NATURAL GAS/ PROPANE  
 OUTLET PRESSURE: 7 INWC/ 11 INWC  
 APPLICATION STANDARDS: NFPA 86:2019 , CSA B149.3:20  
 SSV ELECTRICAL: 120VAC 50/60HZ  
 FCV1 ELECTRICAL: 24VAC 50/60HZ  
 FCV2 ELECTRICAL: 120VAC 50/60HZ  
 ELECTRICAL RATING: NEMA12

F-0002616 REFERENCE  
 (GT161022626-001 - Cover Letter - Rev 0)

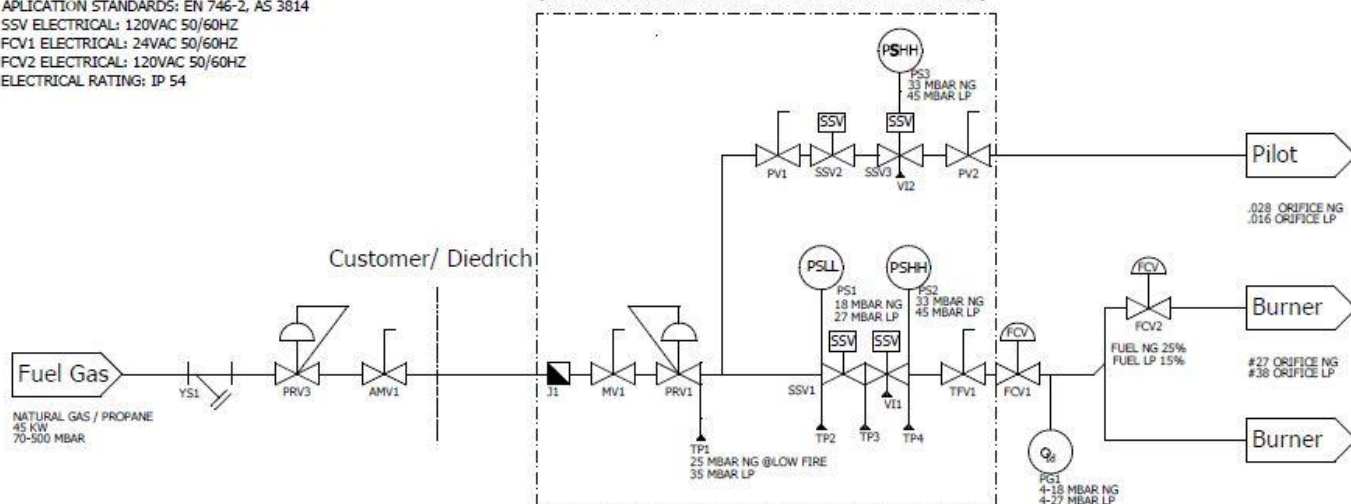


800 1-844-DIEDRICH  
 1-844-DIEDRICH

REV	DATE	DESCRIPTION	BY	CHKD
1	01/01/2021	SCHEMATIC	8	C
GK25-001				
GAS TRAIN DR25 LIA/CSA B149				
Sheet 1 of 1				

MAXIMUM PRESSURE RATING: 500 MBAR  
 MINIMUM/MAXIMUM INLET PRESSURE: 70-500 MBAR  
 GAS TYPE: NATURAL GAS/ PROPANE  
 OUTLET PRESSURE: 18 MBAR/ 27 MBAR  
 APPLICATION STANDARDS: EN 746-2, AS 3814  
 SSV ELECTRICAL: 120VAC 50/60HZ  
 FCV1 ELECTRICAL: 24VAC 50/60HZ  
 FCV2 ELECTRICAL: 120VAC 50/60HZ  
 ELECTRICAL RATING: IP 54

F-0002617 REFERENCE  
 (GT161022685-001 - Cover Letter - Rev 0)

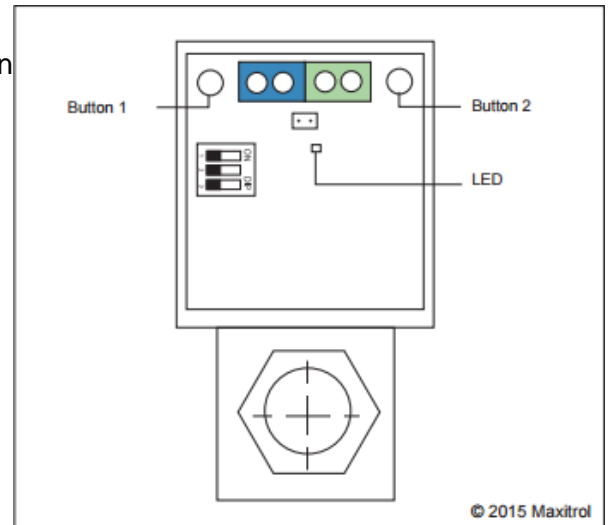


800 1-844-DIEDRICH  
 1-844-DIEDRICH

REV	DATE	DESCRIPTION	BY	CHKD
1	01/01/2021	SCHEMATIC	8	C
GK25-002				
GAS TRAIN DR25 LIA/CSA B149				
Sheet 1 of 1				

### 3.1.6 Maxitrol Tuning:

1. Turn on the system and log in as dmiadmin (auto).
2. Once pilot has lit and flame verification has been established, set fuel to 1% for low fire set point.
3. On Maxitrol control board, hold the button to the right of the terminal block (button 2) until the red led starts to blink. The valve is now in low fire set mode.
4. Button 1 now represents increasing pressure and button 2 decreasing pressure. Use these buttons to set your low fire to the proper INWC. All DR-roasters are set to 1.5 INWC at low fire.
5. Once the low fire is set, press, and hold both buttons simultaneously until the red led turns off.
6. Set Fuel to 50%.
7. Next hold the button to the left of the terminal block (button 1) until the red led turns on. The valve is now in high fire set mode.
8. Button 1 now represents increasing pressure and button 2 decreasing pressure. Use these buttons to set your high fire to the proper INWC per gas and roaster type.
9. Once the high fire is set, press, and hold both buttons simultaneously until the red led turns off.
10. The valve is now set.



### 3.1.7 Staged Burner Percentage

1. If your roaster is equipped with a zone 2 staged burner, the last step is to adjust the fuel % at which the zone 2 or the non-operator side burner is kicked on at.
2. For Semiauto and DR-Flex Roasters, press the Diedrich logo on the home screen.
  - a. With the settings screen up, press, and hold the bottom left corner of the screen until the Diedrich settings come up.
  - b. Adjust the staged burner % to the appropriate value based on gas type 25% for natural gas, 15% for propane.



### 3.2 Water Connection

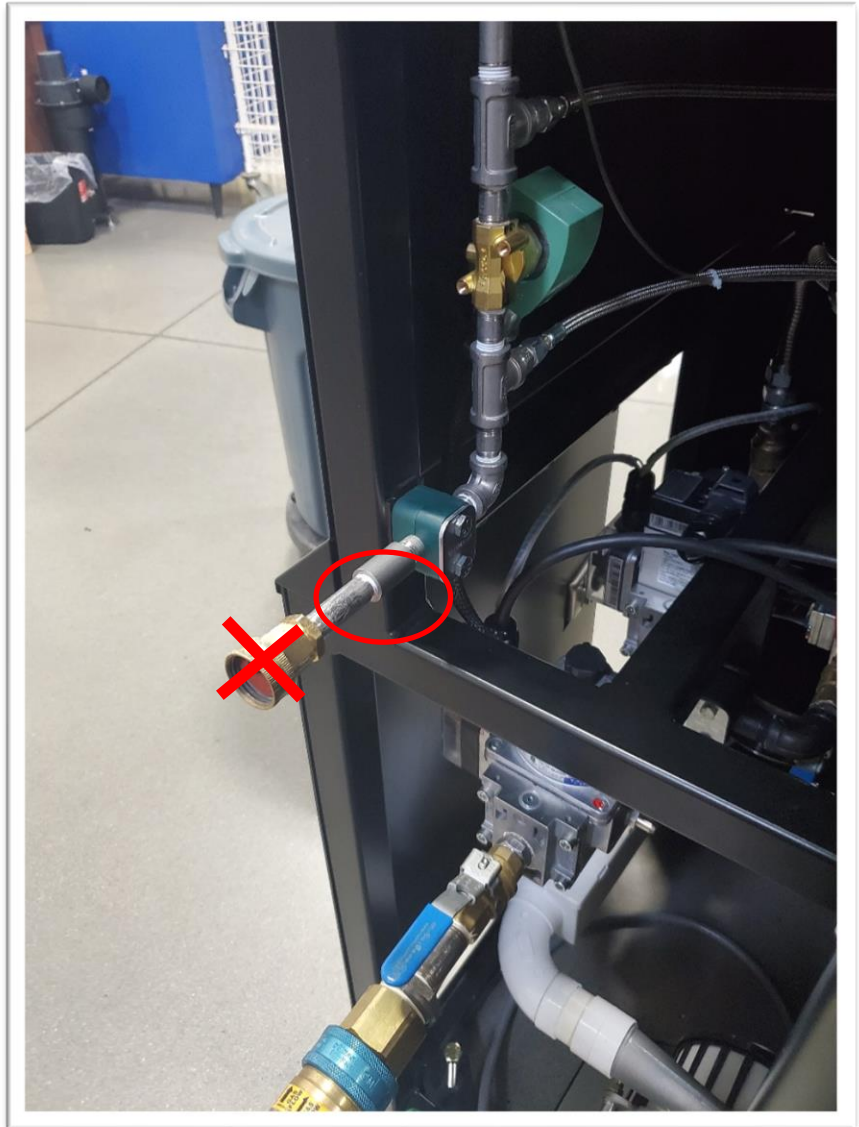
Refer to the **Roaster Guide** for specifications.



**Use a 10-micron water filter prior to connecting water line to roaster inlet** (to protect water nozzle(s) from contaminants and becoming clogged).



Water filter  
cartridge  
examples





### 3.3 Electrical Connections



**Use a licensed electrician for the electrical installation.**

**ELECTRICAL DRAWINGS ARE LOCATED IN THE ROASTER PACKET OF INFORMATION**

Refer to the **Roaster Guide** for specifications. Electrical installation must conform to local regulations.

Do not remove any labels, warnings or rating plates from the roaster or from its components as this may void manufacturer's and Diedrich Roaster's warranties.



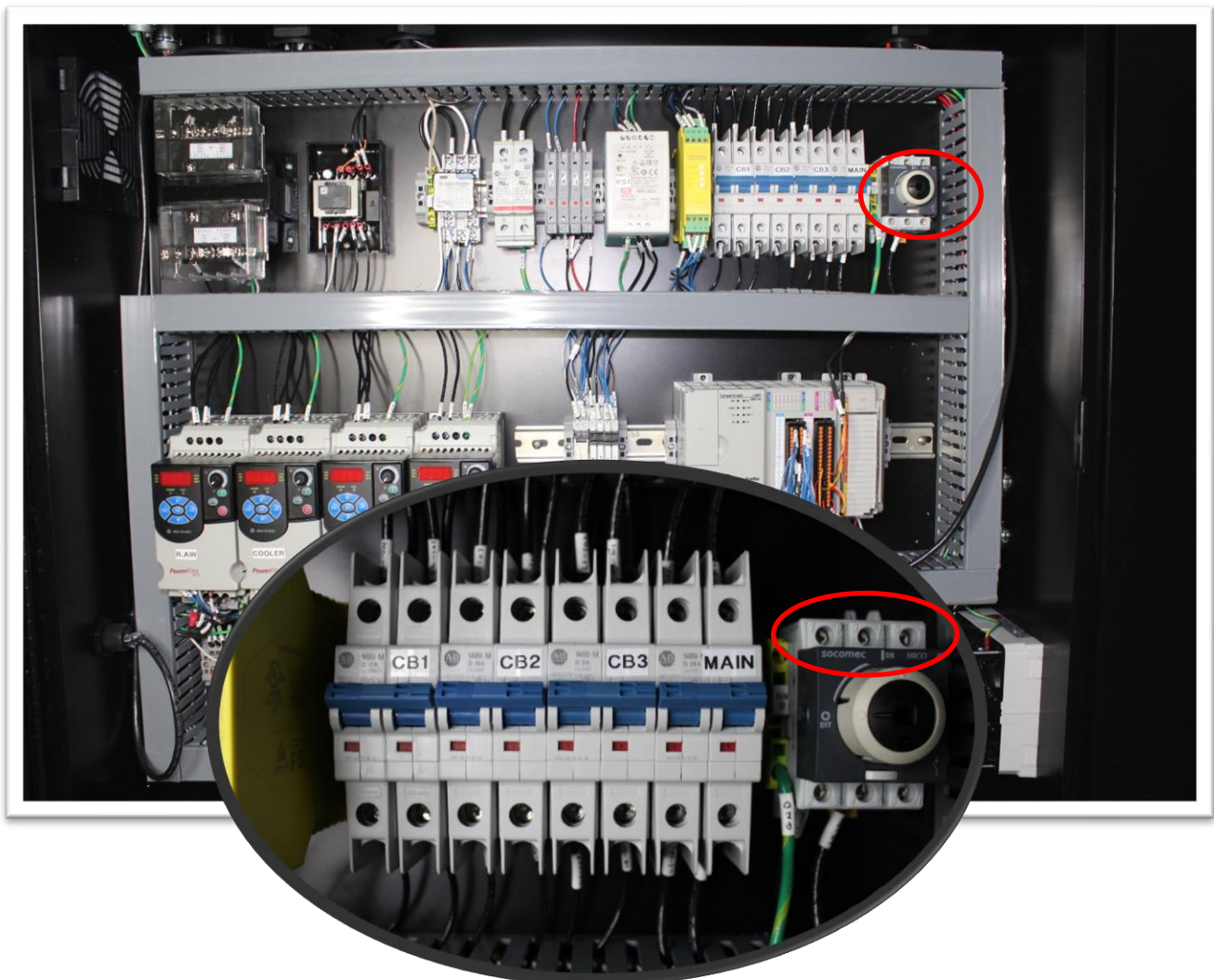
Additional ancillary equipment (i.e., afterburner, loader, destoner, etc.) **will require an additional dedicated circuit separate from the roaster circuit.**

All electrical components supplied in the roaster are grounded electrically to the roaster frame.



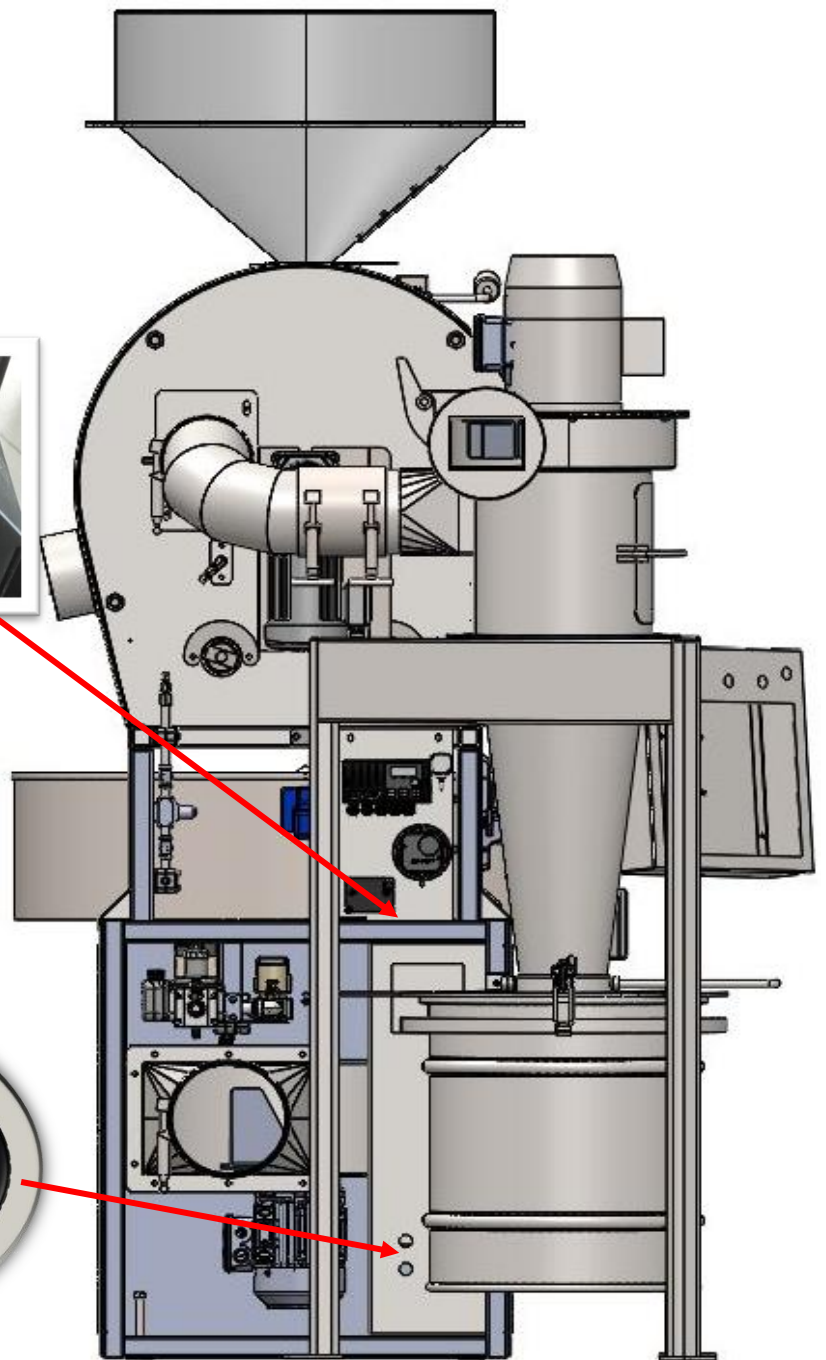
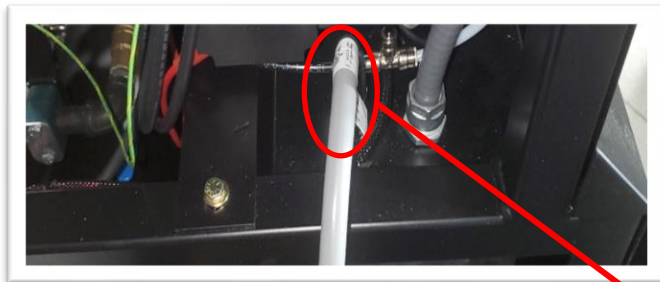
**This roaster must be electrically grounded in accordance with local codes. A severe shock hazard exists if the electrical source is not grounded or if the polarity is reversed.**

#### 3.3.1 Main Electrical Panel - Incoming Power Connection (lower left access door)



### 3.3.2 Motor / Ancillary Connections

Roast Air Motor Connector Cable



1. Loader Motor Connector Cable (optional equipment)
2. Cat 5E Connection for remote access to Diedrich (optional - customer discretion)
3. Afterburner Cable Connector cable (optional equipment)

### 3.4 Ducting

Refer to the **Roaster Guide** for ducting requirements & specifications / layout.



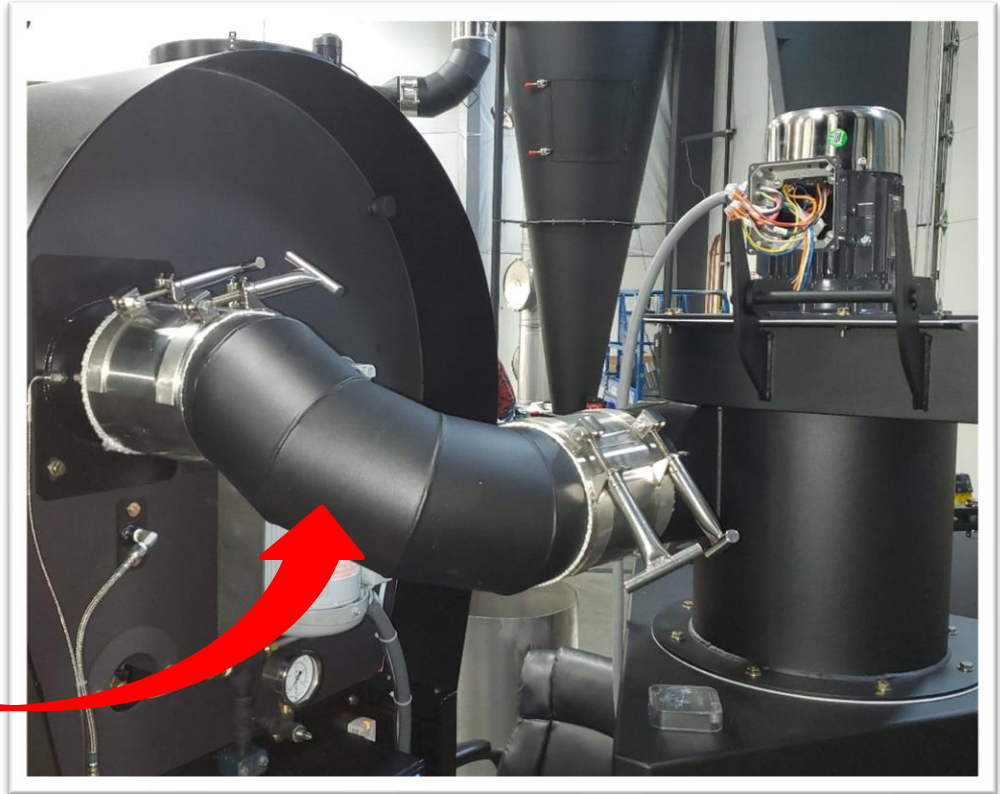
**The roaster *MUST NOT* support the weight of the exhaust system. Ducting must be connected to the roaster based on the ducting manufacturer's recommendation.**



**Fires are caused by failure to maintain a clean roaster and its exhaust ducting system. Regular cleaning of the roaster and exhaust ducting will prevent the buildup of residues that could cause fire.**

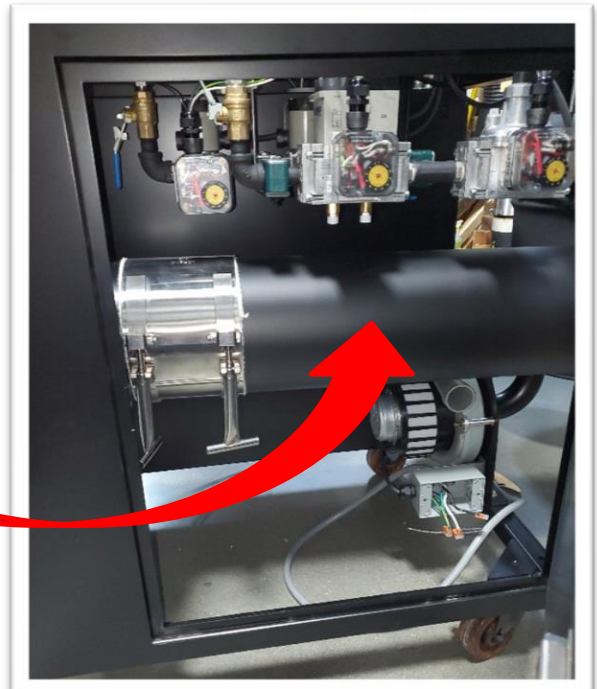
Locate the ducting elbow that connects the exhaust from the rear of the roaster drum to the inlet of the roast air cyclone.

Use the silver “Lorenz” clamps to attach the elbow at both ends. Tighten both T-handles evenly and firm for a snug connection.



Locate the cooling bin ducting that connects from the outlet of the cooling bin blower (front right access door) to your building exhaust ducting.

Use the silver “Lorenz” clamps to attach the elbow at both ends. Tighten both T-handles evenly and firm for a snug connection.





### 3.5 Installation Inspection



**The completed roaster installation MUST BE INSPECTED for compliance to codes and by your local fire department PRIOR TO OPERATING THE ROASTER. Failure to have these inspections performed will void the warranty and will relieve Diedrich of any liability associated with the installation and use of our products.**

## 4 OPERATION

### 4.1 Initial Start-Up / Shutdown (Refer to the Automation Manual)

### 4.2 Power Loss/Outage

In the event of a power loss while roasting, the front of the drum shaft is designed to accept a  $\frac{3}{4}$ " hex socket. Use an air impact wrench to rotate the drum in a clockwise direction.



## 5 ROASTING



**A possibility of fire exists if the coffee is not removed from the drum before 500°F (260°C).  
The coffee may ignite even though the ignition is interlocked to shut down at 485°F (252°C).**



The instructions below explain the operation of the roaster. They are not an attempt to teach all the subtleties and proper techniques of roasting the many varieties of coffee beans. Further information on roasting is available during the Diedrich Roasters roasting seminars.

Average 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. Reducing the burner flame is one of several ways to lengthen roast times. The temperature of the roasting system (comprised of the coffee beans, roasting drum, and end plates) reacts slower than the flame adjustments. Do not expect an immediate temperature change when the heat level is changed. After a short time, the beans and roasting system will show signs of dissipating heat.

The bean development and color can be observed by using the sample trowel. You can develop a consistent roast profile by referring to a set of roasted bean samples or color tiles. Sampling of beans should be consistently viewed under a full-spectrum natural fluorescent lamp to maintain a consistent sample comparison.

### 5.1 Seasoning the Drum

The drum of the roaster must be seasoned before roasted coffee is fit for consumption. Use an inexpensive coffee for the seasoning process. Robusta coffee does not emit enough oil for the seasoning process.

The new drum requires at least 5 to 10 seasoning roasts to become properly oiled. Each seasoning roast requires about 50% of roaster capacity 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. Seasoning the roasting drum will give you the opportunity to become familiar with the roaster's controls and the roasting process itself.

1. Set the Roast Air to "0" %.
2. Preheat the roaster to 460°F (237°C).
  - a. NOTE: A cold roaster should warm for approximately 30 minutes before seasoning.
3. Load the green coffee beans into the funnel, through the hopper gate and into the drum.
4. Set the flame control to roughly 50%.
  - a. NOTE: The coffee will change in color from green to a pale yellow. During this progression look through the drum door view window, you will start to see chaff, the bean's outer skin, separating from the coffee bean. Unwashed coffee has considerably more chaff than washed coffees and decaf coffees have almost no chaff.
5. The Roast Air % should be set to 50% when the coffee reaches the yellow stage 270°F (132°C).
  - a. NOTE: The moisture in the coffee, which was a good conductor of heat early 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 (CO<sub>2</sub>) gas.
6. After the cinnamon color stage of the roast is reached, the coffee will start its first cracking. Set the roast air % to 100% for the remainder of the roast.
  - a. NOTE: 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.
7. Allow the roast to progress through the second crack.
8. Turn off the main burners once traces of oil begin to show on the beans.
  - a. NOTE: At this point you are attempting to slow the rise per minute and coast to an oily bean temperature but not reach the high temperature limit. This allows you to



keep the roast in the drum while the beans are oily and coat the drum surface. The bean temperature can cool but adjust the burner to keep them above 350°F (176°C).

9. Once the oil has soaked back into the beans, turn on the agitator, set the cooling air to 100%, and discharge the coffee into the cooling bin.
10. Repeat this complete dark roasting cycle (50-60 minutes) 5-8 times, then start to develop lighter (15-18 minutes) roasts. This procedure will properly season the roasting drum.

## 5.2 Roasting for Consumption



**If any of the following happens: Excessive smoke in the room; smoke coming from the sample trowel port; longer cool down times; excessive chaff in the burner compartment - Check for the following: Excessive build-up of residue throughout the airflow system within the roaster. Excessive build-up of residue in the exhaust ducting.**



Diedrich recommends that you maintain roasting and cleaning logs (**See example in the Roast Log at the end of this manual**). These logs will aid in tracking the amount of coffee roasted, roasted bean weight loss, and cleaning intervals.

**Type of Coffee:** Naturals (unwashed coffees, i.e., Indonesians) have more chaff than washed coffees (i.e., Central and South American coffees) and decafs have virtually no chaff. *EXAMPLE: 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.*

**Weight Loss:** The green weight IN minus the roasted weight OUT divided by the green weight equals the percentage of weight loss. *EXAMPLE: 15 lbs. IN minus 12.75 lbs. OUT = 2.25 lbs. / 15 lbs. IN = 15% weight loss.*

1. Preheat the empty drum until the bean temp display (1) reads 415°F (213°C) or until you reach your desired charge temperature.
  - a. **NOTE:** A cold roaster should warm for approximately 30 minutes before roasting.
2. Load the green beans into the hopper funnel after the roaster's empty drum has been preheated.
  - a. **NOTE:** The charge temperature is the temperature which the beans are loaded into the drum. Depending on type of coffee, batch size, and roasting technique charge temperatures will typically be between 350°F (177°C) and 440°F (227°C). The display temperature will fall drastically after charging. The temperature at which the coffee stops decreasing and starts rising is known as the bottom out temperature. Charge temperature and initial fuel setting are determined by, but not limited to, the desired bottom-out temperature and rate of climb from bottom-out.



**Do not allow green beans to sit in the hopper for prolonged periods of time. This area of the roaster becomes very hot and beans sitting in the hopper will result in pre-roasting, uneven roasting.**

3. Prior to starting the roasting process, set the Roast Air to 0%.
  - a. **NOTE:** This also allows sufficient airflow through the drum to gently assist in the heating process without excessively drying out the coffee. The Diedrich Coffee Roaster utilizes the moisture that is present in the green coffee to assist in the conduction of heat to the core of the bean. Our philosophy is to allow the beans to absorb heat at their own natural potential since various types of coffee have different weight densities and absorb heat differently.
4. Move the hopper gate handle up to release the green beans from the hopper into the drum.
5. Move the handle down to close the hopper gate.
  - a. **NOTE:** If the hopper is not closed after loading, heat will be lost and roasting time will be longer.
6. Adjust the flame control to an appropriate heat setting for the batch size.
  - a. **NOTE:** A larger batch has greater heat absorbing capacity, and a higher flame setting can be used without accelerating the roast too quickly.
  - b. The display temperature will fall drastically after charging the drum with beans. The

temperature at which the coffee stops decreasing and starts rising is known as the bottom-out temperature. Charge temperature and initial fuel setting are determined by the desired bottom-out temperature and rate of climb from bottom-out.

- c. The beans turning yellow is an easy stage of roast to identify. It makes a good time/color reference point at about six or seven minutes. The yellow color of varietal coffees is an off shade of orange for decaf coffees. The yellow color indicates about 270°F (132°C).
  - d. The coffee requires more heat if you are at six minutes but far from the yellow color. The coffee requires less heat if you are at four minutes and the coffee is already turning yellow. The yellow color of varietal coffees is an off shade of orange for decaf coffees.
7. Set the Roast Air to 100%.
    - a. **NOTE:** *This increased flow of air through the drum exhausts the chaff shedding from the beans out of the drum.*
  8. Leave the Roast Air at 100% until the coffee has reached a cinnamon brown color.
  9. Return the Roast Air to 50% once the beans have reached a cinnamon brown color.
    - a. **NOTE:** *The cinnamon brown color is another checkpoint that is easily identifiable. You should reach this color at 340°F (171°C) in 9 to 11 minutes. Some fine-tuning of the fuel percentage may be necessary at this point.*
    - b. Between 11 and 13 minutes the beans will reach the 1st Crack and you will observe a gradual color change of the beans to brown. This is the most significant stage of bean development where the beans fully open up. The roasted coffee may be ready to release into the cooling bin for a lighter roast. The chemical changes in the coffee start to produce a large volume of carbon dioxide (CO<sub>2</sub>) gas. This gas will pressurize the roasting drum.
  10. Reduce fuel % and set the roast air to 100% for the remainder of the roast.



**The bean development accelerates very rapidly, and these last few minutes are very critical. The operator should pay close attention to the coffee and frequently sampling is important. While learning to roast, it is advisable to lower the heat to slow down this stage of the roast.**

11. Prepare to discharge the roasted coffee into the cooling bin.
12. Turn the Cooling Air on and set to 100%.
13. Turn "ON" the Agitator.
14. Open the drum door to dispense the roasted beans into the cooling bin.
15. When cool, open cooling bin gate and dispense beans into container.

Weight loss is a good indicator of the degree of roast. Variables such as humidity, coffee storage, and ambient air temperature will also affect the weight loss. It may go up or down 1% from day to day or month to month, but you should 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.

## 6 DESTONER OPERATION (optional)

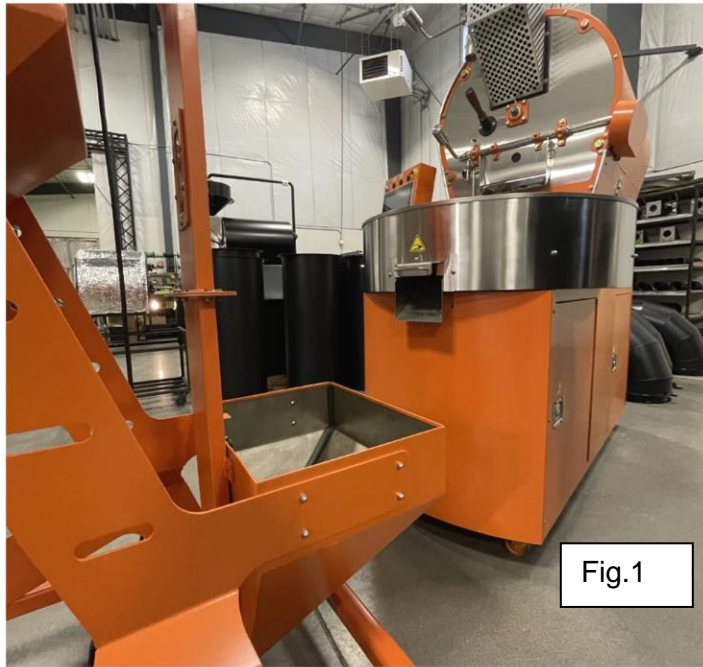


Fig.1



Fig.2

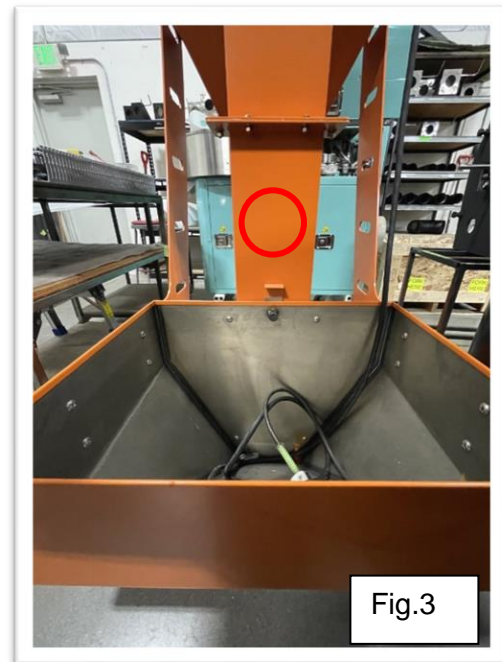


Fig.3



Fig. 4

Loosen the knob and adjust the air intake slide gate at the bottom of the cart to a default value of approximately "2 1/2" perforation

rows and tighten - Fig.2

Loosen the knob that secures the vertical bean chute and push slide gate all the way down for a "no bean flow" starting point. (This slide gate will be slightly opened once beans are in the cart) – Fig. 3

Open the roaster cooling bin gate to discharge beans in to the destoner cart – Fig.1

With building electrical power applied to the destoner unit cord, turn on the destoner using the "red" operator knob located at the top of the destoner. Air Volume (motor speed) is controlled with the potentiometer knob. – Fig. 4

Adjust the vertical bean chute slide gate "up" just enough to get beans to flow (too many beans flowing will clog the chute).

When beans start flowing upwards, fine tune adjustments can be made. Changes made between the motor potentiometer (air volume) and air intake slide gate (air velocity) in combination, will result in different air flow characteristics.

For best results, the process should be as slow as possible without stopping the transfer of beans. When finished, periodically empty the spring-loaded door at the bottom to remove unwanted debris – Bottom of Fig. 2

**NOTE:** It is normal to find small amounts of good product in this area as well. Below is an example of the test material used in the factory tests. Under roasted coffee has been used in the tests along with a series of stones to test the performance of each destoner.

