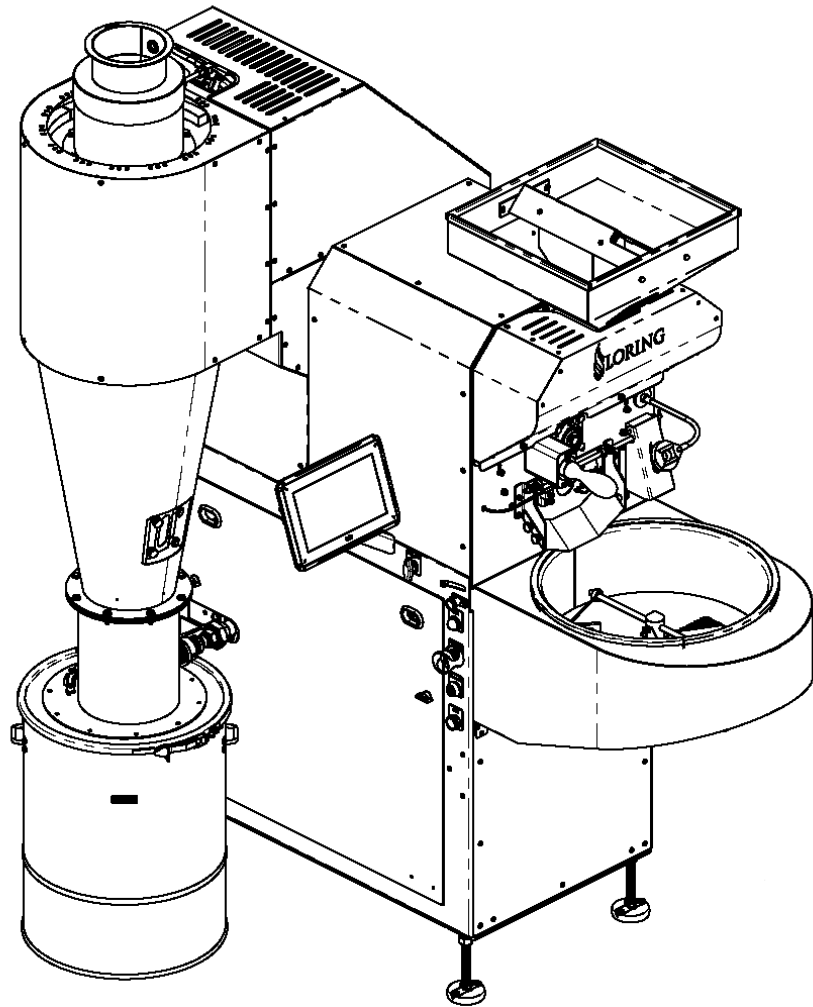




L O R I N G



# Pre-Installation and Site Preparation Guide

**Loring S7 Nighthawk<sup>TM</sup> Coffee Roaster**

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# Notices

## Document Versioning Information

**Document No. 1008816 Rev B**

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The name LORING SMART ROAST, the Loring logo, and the catchphrase “The Smarter Way To Roast” are all trademarks of Loring Smart Roast, Inc.

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

This manual, along with other manuals in this series, is intended to be a guideline for the installation and use for the product lines manufactured by Loring Smart Roast, Inc. The customer is responsible for complying with all applicable regulations.

The customer should refer to a licensed professional contractor or contractors for all installation details.

## Dangers, Warnings, and Cautions

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.

## Pre-Installation and Site Preparation Guide General Notes

Follow all written instructions provided by Loring, and verbal instructions from Loring Customer Support, regarding site preparation prior to receiving the coffee roasting equipment.

All contractors or subcontractors involved in installation or working with specific connections (e.g., water, gas, electrical, hot and cold exhaust ventilation) should be fully licensed and qualified in that particular functional area.

Comply with all applicable rules and regulations and governing agencies.

Loring reserves the right to change information within this document at any time without notice.

# Contents

<b>Introduction</b>	<b>7</b>
Audience	7
Acquiring a Coffee Roaster	7
<b>S7 Specifications</b>	<b>9</b>
Requirements for Utilities	10
Power Specification	10
<b>Dimensions and Clearances</b>	<b>11</b>
Overall Footprint	11
Footprint – S7 Roaster	12
Floor Clearances – S7 Roaster	13
Overhead Clearances – S7 Roaster	14
Footprint - S7 Roaster Feet	15
<b>Space Planning</b>	<b>16</b>
Indoors	16
Floor	16
Stack Connection Location	17
Door Openings	18
Local Codes	19
Utilities	19
Room Size and Ventilation	19
Low Ceiling	20
Multi-Story Buildings	20
Workflow Space	21
Lighting	23
Network	23

<b>Receiving Shipment</b>	<b>24</b>
Shipping Notes	24
S7 Shipping Crate	25
Lifting and Moving the Roaster	27
<b>Next Steps</b>	<b>30</b>
Site Preparation Checklist	30
<b>Gas and Gas Supply</b>	<b>31</b>
Propane Fuel Installation Specifications	32
Natural Gas Installation Specifications	33
<b>Installing the Vent Stack</b>	<b>34</b>
Vent Stack Configurations	36
<b>Manufacturer Contact Information</b>	<b>38</b>

# Introduction

## Audience

The intended audience for this manual, the *S7 Pre-Installation and Site Preparation Guide*, includes customer-side administrators, floor employees, general contractors, facilities managers and other individuals who are responsible for preparing the site for installation of the roaster.

## Acquiring a Coffee Roaster

Preparing for and installing a Loring coffee roaster requires cooperation between the customer and Loring over several weeks. Generally, the customer should begin preparing the site 3 months prior to shipping. Upon receiving the roaster, the customer's general contractor assembles the roaster, connects the utilities including water, gas, and electric, connects the hot and cold exhaust ventilation, and then waits for the Loring Field Service Technician to perform final system commissioning. The commissioning period also includes hands-on customer training in the use and maintenance of the roaster.

Some tasks, such as ordering stack ventilation components, may require specifying and purchasing equipment from third-party suppliers. Allow sufficient lead times.



**WARNING:** Operating the roaster prior to final inspection and commissioning by an authorized Loring Field Service Technician will void the warranty.

## Additional Documentation

The following additional documentation is available to aid with installation and setup. Contact your Loring Account Representative for more information.

- **Welcome Packet.** The *Welcome Packet* contains detailed instructions and information sent by Loring to each new customer upon purchase of a coffee roaster. One item, the Product Specification Form, must be completed and returned to Loring in order for Loring to begin building the roaster.
- **Suggested Stack Manufacturers.** One of the items in the Welcome Packet is a list of recommended manufacturers of stack ventilation components. Loring recommends ordering stacks 6 weeks prior to the arrival of the roaster.
- **Installation and Assembly Guide.** After receiving the coffee roaster, the customer must engage with a licensed general contractor to assemble, position, and hook up the roaster to various utilities and stack ventilation.
- **Mechanical Interface Control Documents (MICDs).** These technical drawings provide detailed information on system dimensioning and components, as well as system weights. They are intended for permit submittals and for use by general contractors, as well as by architects and facilities planners. These drawings are available upon request from Loring.
- **Special Reports for Permitting.** Additional reports on various technical subjects are available from Loring. Each customer may need to satisfy unique local or regional regulatory requirements. For example, air quality reports are typically required, and some locations may require both county and city permits.

# S7 Specifications

**Table 1. S7 Basic Equipment Specifications**

S7 Specification	Value
<b>System Weight</b>	840 lbs (381 kg)
<b>Maximum Batch Size</b>	15 lb (7 kg)
<b>Minimum Batch Size</b>	3 lb (1.4 kg)
<b>Nominal Electrical Power</b>	0.6 kW
<b>Peak Electrical Power</b>	2.9 kW
<b>Maximum BTU Rating</b>	86,000 BTU/h (22 K kcal/h)
<b>Hot Stack Max Continuous Temperature <sup>1</sup></b>	1400 °F (760 °C)
<b>Hot Stack Max Intermittent Temperature <sup>1</sup></b>	1500°F (816°C)
<b>Hot Stack Max Flow <sup>2</sup></b>	15 dscfm (26 dsm <sup>3</sup> /h)
<b>Hot Stack Max Flow (Peak Air Cool) <sup>4</sup></b>	120 dscfm (200 dsm <sup>3</sup> /h)
<b>Hot Stack Minimum Duct Diameter <sup>3</sup></b>	6 in (152 mm)
<b>Cooling Exhaust Max Flow <sup>4</sup></b>	340 scfm (578 sm <sup>3</sup> /h)
<b>Cooling Duct Diameter <sup>3</sup></b>	6 in (152 mm)

**Notes:**

- 1 Consult local and regional regulations for air quality, temperature, and emissions restrictions.
- 2 Dry, or water content of the flue removed, under standard pressure and temperature conditions, i.e. 29.9 in HG (760 mm HG) and 68°F (20°C).
- 3 Larger stack diameters or stack openings may be required under some conditions.
- 4 Add the Hot Stack Max Flow (Peak Air Cool) and Cooling Exhaust Max Flow to obtain the total air flow out of the building. This may be needed in the event that additional air intake, otherwise known as makeup air, is needed at the installation site.

## Requirements for Utilities

In order to ensure proper roaster performance, the customer should verify that the site utilities meet basic requirements for water and gas. The customer must indicate whether the site uses natural gas or propane.

**Table 2. S7 Utilities Requirements**

S7 Specification	Value
<b>Water Supply (Flow) Minimum</b>	1 GPM (3.8 LPM) or greater
<b>Water Pressure Minimum</b>	40 psi (276 kPa) or greater
<b>Natural Gas Pressure (Min/Max Range)</b>	4 - 7 in WC (1.0 - 1.7 kPa)
<b>Natural Gas Caloric Content, Minimum</b>	1000 BTU/ft <sup>3</sup> (37 MJ/m <sup>3</sup> ) or greater
<b>Propane Gas Pressure (Min/Max Range)</b>	11 - 13 in WC (2.7 - 3.2 kPa)
<b>Propane Gas Caloric Content, Minimum</b>	2500 BTU/ft <sup>3</sup> (93 MJ/m <sup>3</sup> ) or greater

## Power Specification

The S7 roaster requires a power supply that is 200 to 240 VAC, single phase, 50/60 Hz with a amperage supply of 20 Amps.

# Dimensions and Clearances

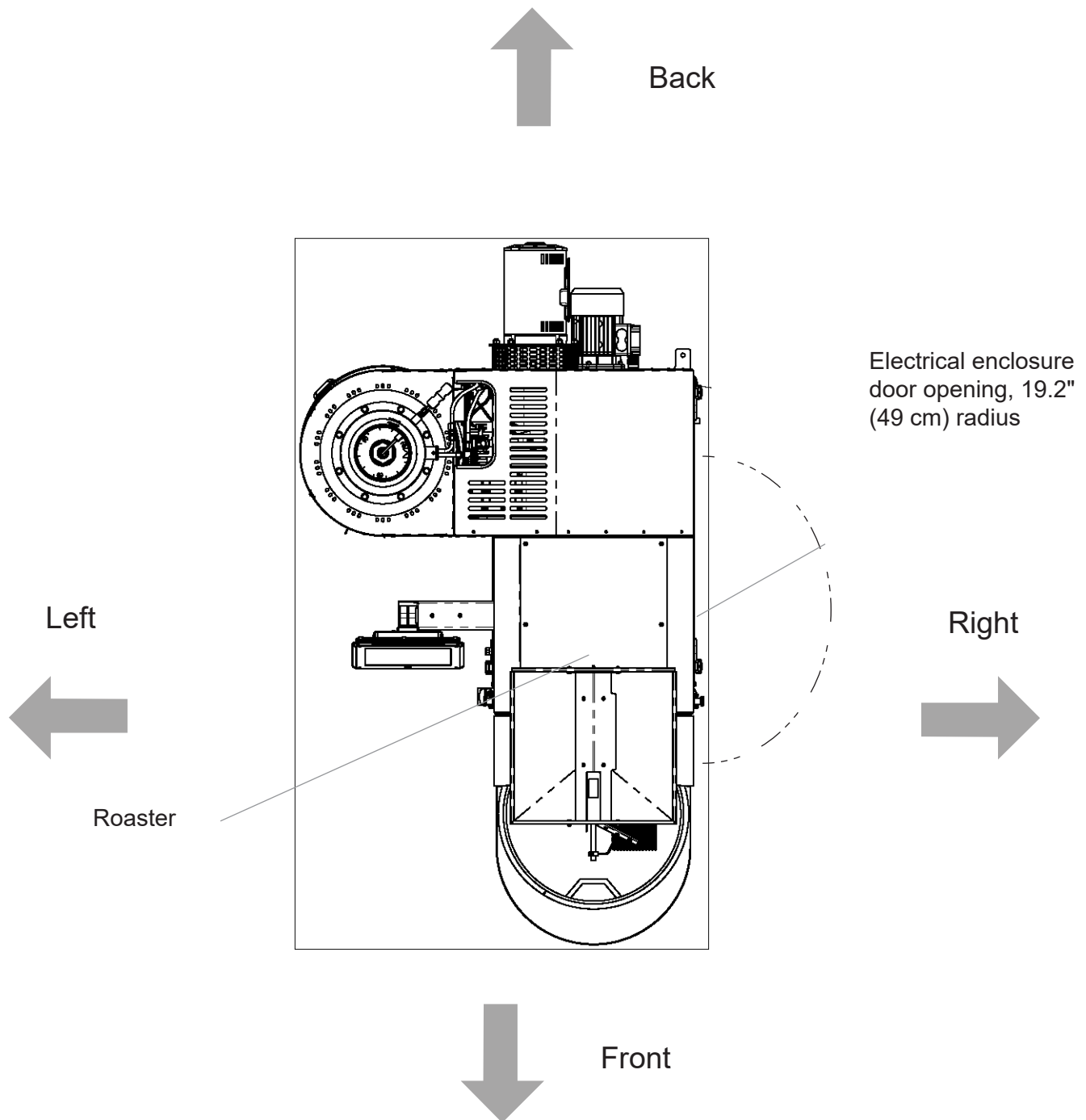
## Overall Footprint

**Table 3. S7 Dimensions and Clearances**

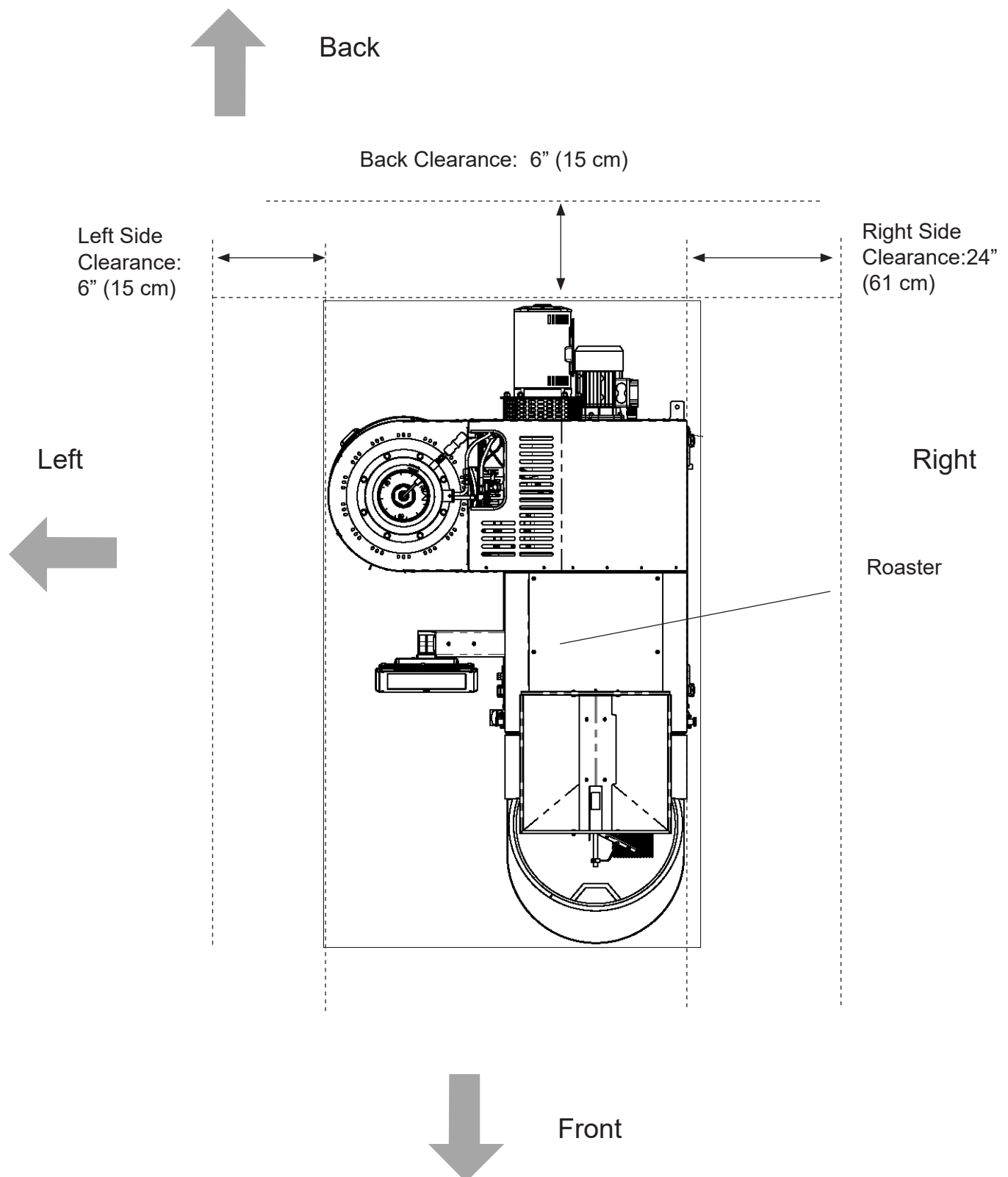
S7 Dimension	Value
<b>Footprint</b>	41" W x 72" L x 82" H (104 cm W x 183 cm L x 208 cm H)
<b>Clearance</b>	6" left, 24" right, 6" back (15 cm left, 61 cm right, 15 cm back)
<b>Roaster Height</b>	82" (208 cm)
<b>Minimum Ceiling Clearance</b>	12" (31 cm) above Stack Hat
<b>Total Minimum Ceiling Height</b>	94" (239 cm)

Refer to the *Mechanical Interface Control Document (MICD)* from Loring for further information, including CAD diagrams with construction details.

# Footprint – S7 Roaster

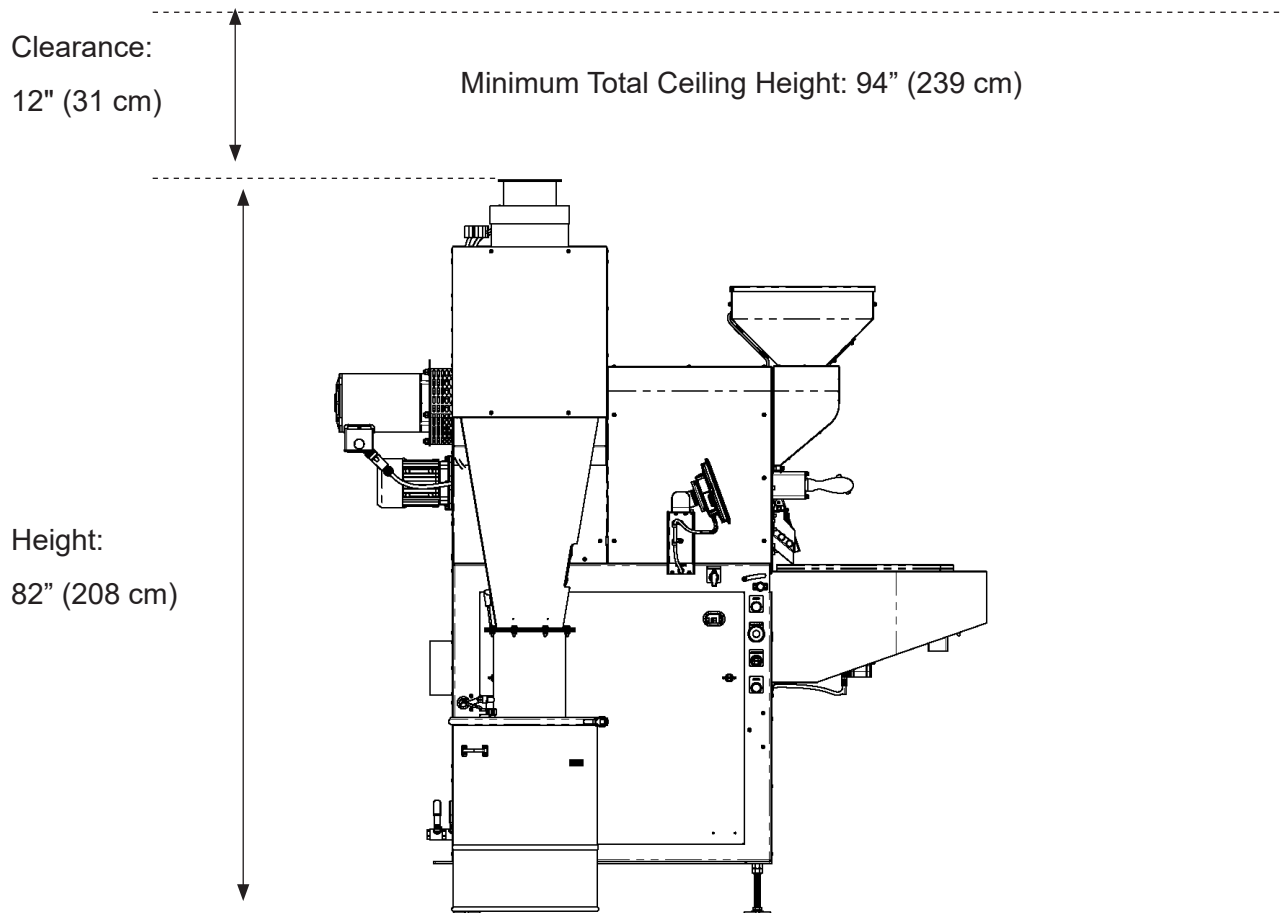


# Floor Clearances – S7 Roaster



# Overhead Clearances – S7 Roaster

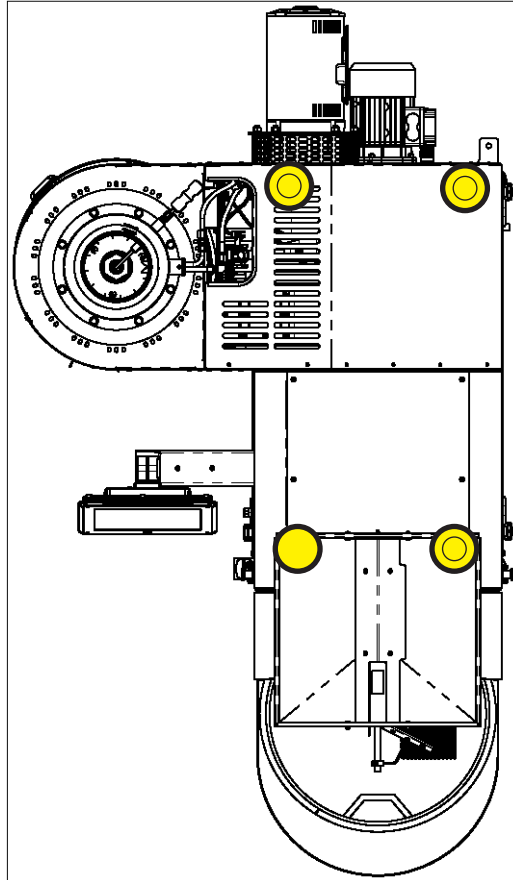
6" left, 24" right, 6" back  
(15 cm left, 61 cm right, 15 cm back)



Overhead clearance should accommodate the roaster plus a minimum stack height. This clearance is also necessary for routine maintenance, as well as providing room to maneuver during installation.

# Footprint - S7 Roaster Feet

For dimensions of roaster feet spacing, contact Loring Support for the S7 MICD.  
support@loring.com



The roaster rests on 4 Roaster Feet, which support the entire weight of the roaster and allow for leveling on uneven floor surfaces. The floor must be able support the concentrated weight.

# Space Planning

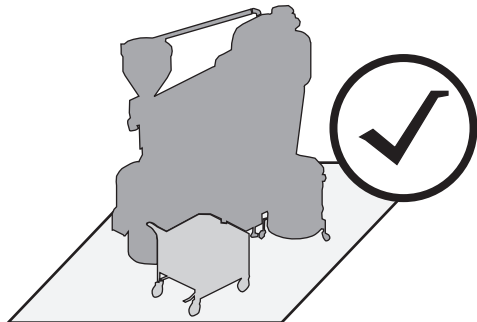
## Indoors



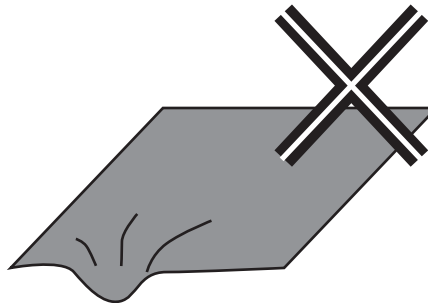
Locate the coffee roaster in an area that is protected from the elements and from water intrusion. The area does not need to be a fully conditioned space.



## Floor



Flat and Level



No Soft Spots

Place the roaster on a flat, level, and firm surface such as hard wood or concrete. The floor should be strong enough to support the total system weight of the roaster and all supplemental equipment.



**WARNING:** Do not place the roaster on a soft or unstable surface.



**CAUTION:** Use care when transporting the equipment over bumpy or uneven flooring.

# Stack Connection Location

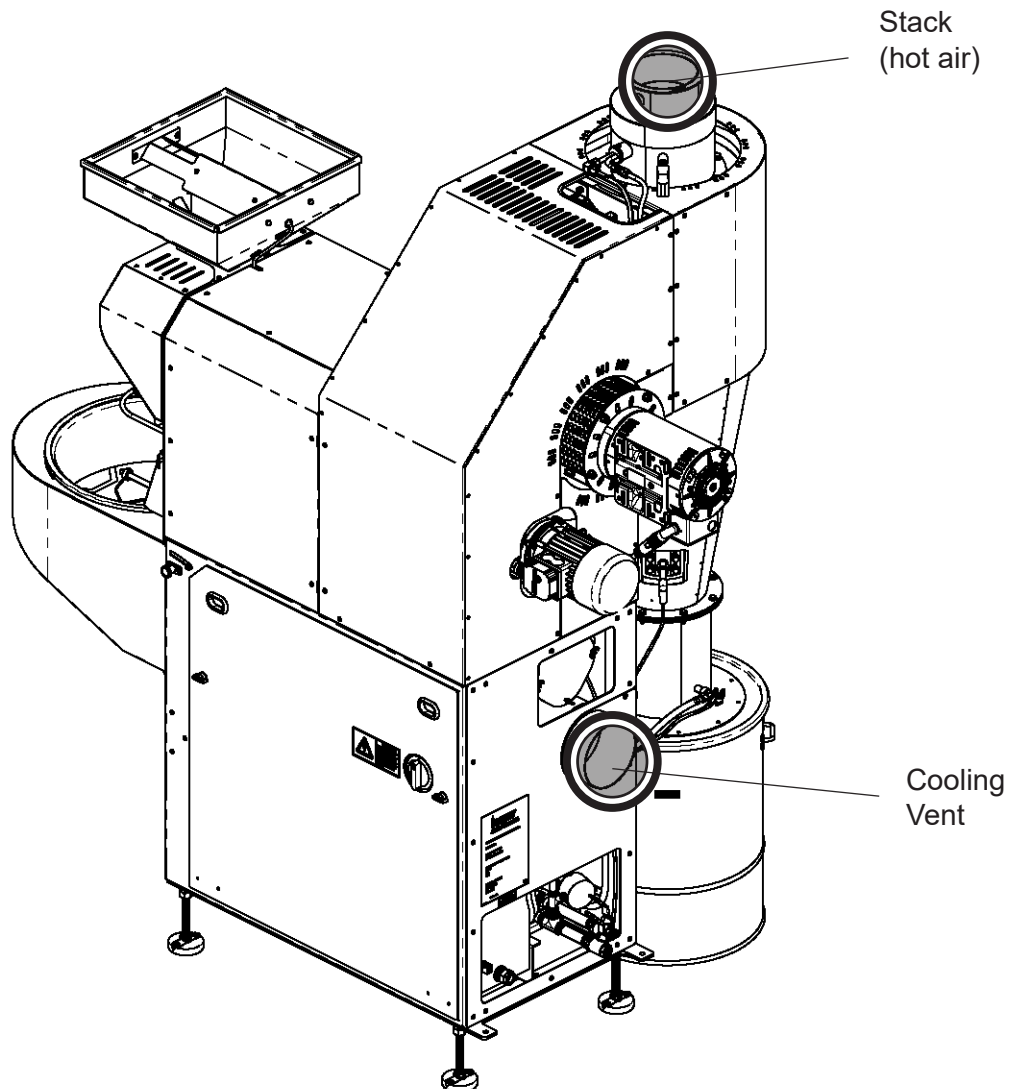
The ventilation stacks connect to openings in the wall or roof. An optimal location is directly above the corresponding stack connections on the roaster.

**Refer to the Mechanical Interface Control Documents from Loring for:**

- Exact dimensions and locations on the roaster.
- Stack elbow options for routing through existing openings.

Check local building codes for additional stack ventilation requirements.

Assistance with stack design is available through Loring upon request. Loring recommends engaging with a stack design consultant to create details for complex site configurations.



# Door Openings

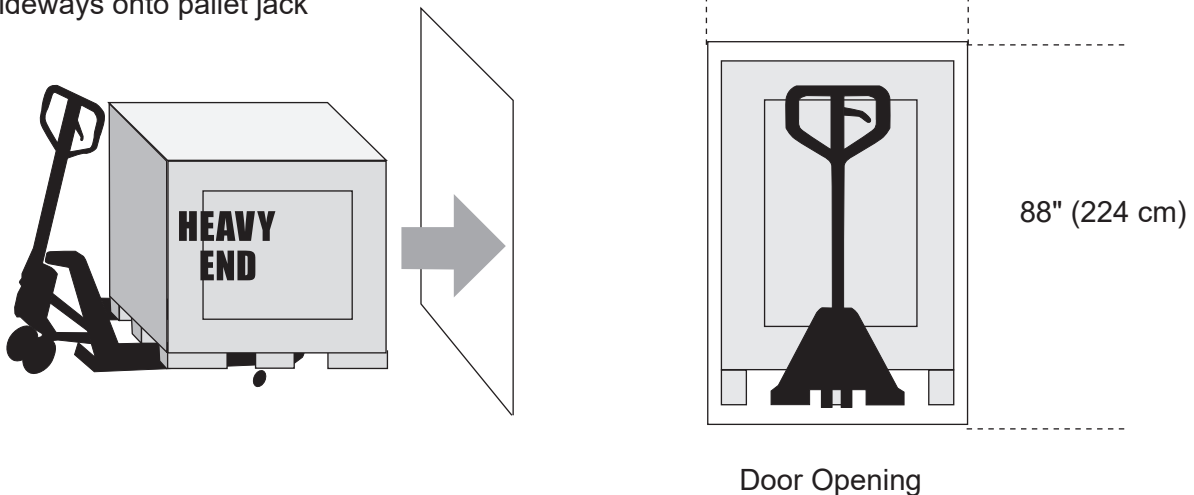
Customers must consider not only the room where the roaster will be installed, but also any openings or corridors that the roaster equipment must fit through during transport and assembly.

Generally speaking, the smallest opening for the S7 (crated) 88" (224 cm) tall by 50" (127 cm) wide if the crates are side loaded onto a pallet jack, Heavy End inwards. However, under special circumstances, Loring may be able to suggest further measures to fit a piece of equipment through a tighter space.

For more information on S7 crating dimensions go to [S7 Shipping Crate on page 25](#)

## Minimum Recommended Door Opening for S7

For small openings, load crate sideways onto pallet jack



### Crate Handling Dimensions:

Wide	46" (117 cm)
Long	78" (198 cm)
Height	85" (216 cm) + 3" (8 cm) for pallet jack
Weight	1200 lbs (544 kg)

For installation in locations that the fully assembled roaster will not fit, it may be required to remove the roaster's HMI Screen and Cyclone. Refer to the Installation and Assembly Guide for the removal and installation procedures. When removing the Cyclone, the Cyclone Removal Kit will need to be purchased separately from Loring.

## Local Codes

Local building codes and regulatory standards may require additional steps during construction and installation in areas such as seismic reinforcement or air quality. Allow sufficient time to address these requirements, including steps for mitigation if needed.

## Utilities

A licensed professional should evaluate the utility services at the installation site with the minimums shown under the Specifications section, and test that each utility meets the listed requirements. For example, if actual gas pressure is lower than rated, the roaster will not function properly.

It is important to verify that this information is correct, because the roaster will be configured to match what is available at the site. For example, some 220V AC electrical outlets are actually 230V. Note also if the gas supply is propane or natural gas.

## Room Size and Ventilation

If the roaster is located in a small, sealed room, the air outflow from the hot air and cooling air vents can create negative air pressure inside the room. Additional air intake may be needed. Refer to the Specifications section of this manual for more information.

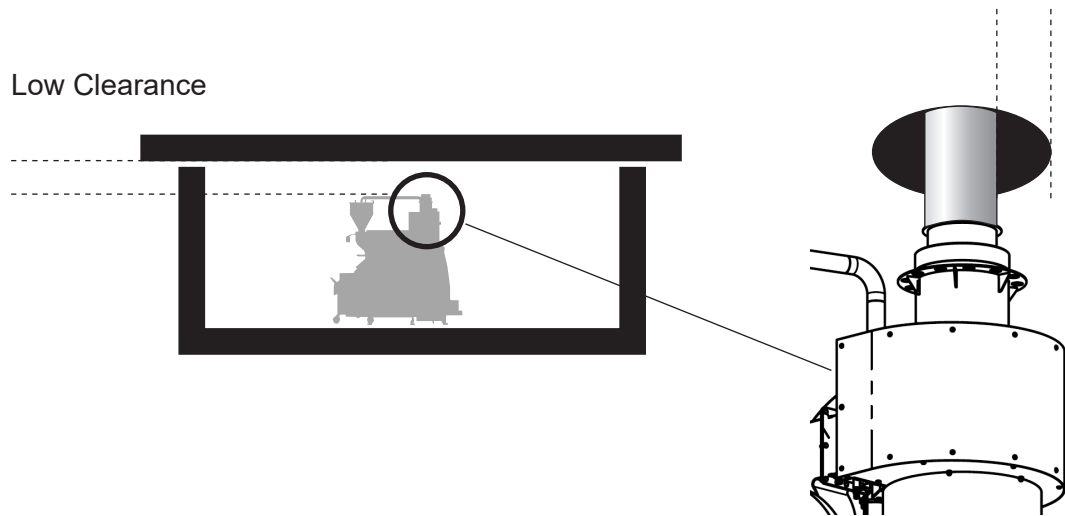
For the S7 roaster, the total air intake flow rate is the combination of the Hot Stack Max Flow (Peak Air Cool) and Cooling Vent Max Flow from [Table 1. S7 Basic Equipment Specifications on page 9](#).



## Low Ceiling

For rooms with low ceilings, the stack opening should be bigger than stack to allow air space for cooling, and so radiant heat can dissipate. Refer to local code requirements for the amount of space to allow. Radial stack clearances may differ based on stack manufacturer's installation requirements. Additional rain proofing measures may be required.

Contact Loring for assistance with custom configurations for very low ceilings.



## Multi-Story Buildings

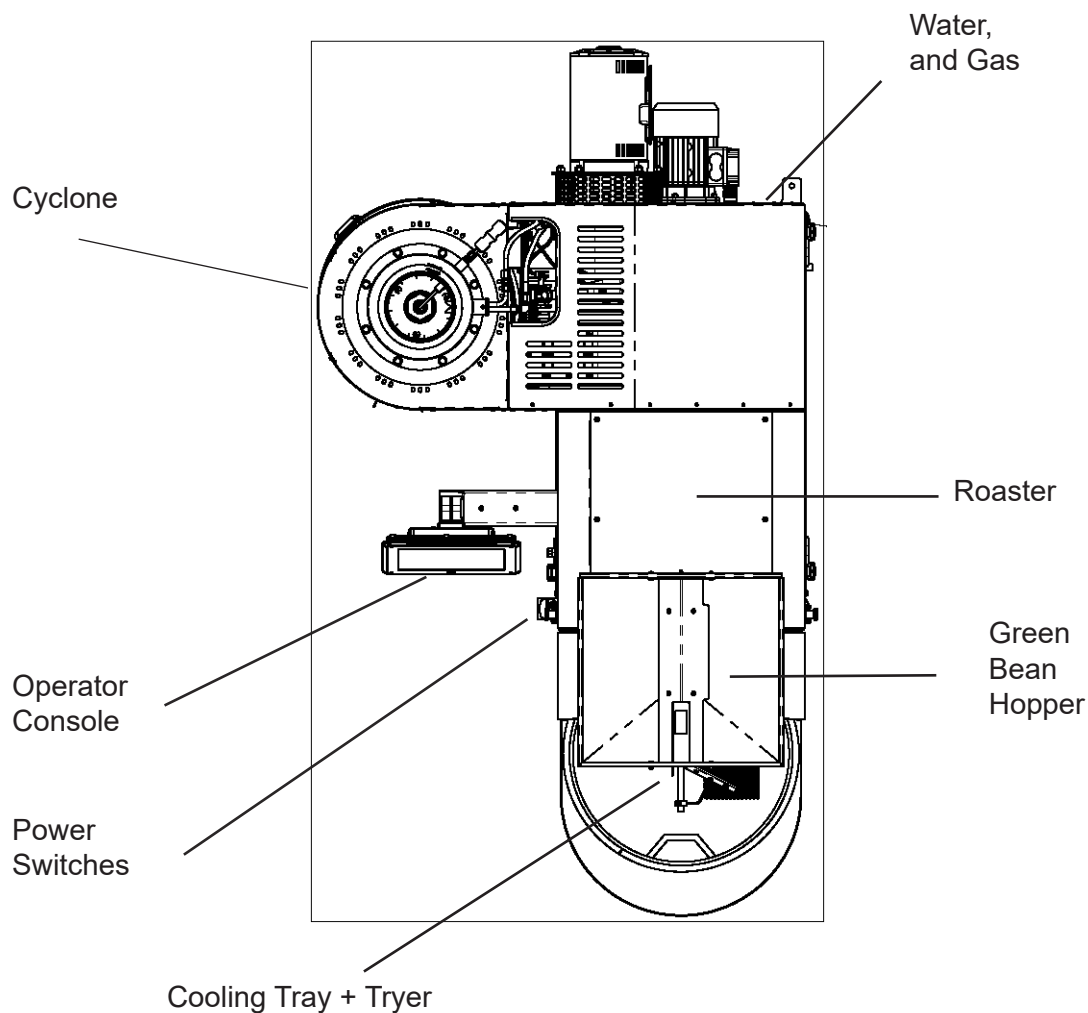
If the ceiling is taller than 15 feet, the stacks can go straight up and out of the roof, or they can bend after a certain height and exit the wall instead. This height may vary based on local regulatory requirements.

During roaster operation, air from the Hot Stack is a continuous 1400 degrees F (760 degrees C), and can get as hot as 1500 degrees F (816 degrees C). Check local code requirements on wall openings for hot air ventilation. Some municipalities may not allow hot air to be vented directly onto a sidewalk or pedestrian walkway.



# Workflow Space

Workflow refers to the smooth operation of one or more personnel within the same physical space. Both access and lighting should be considered. Some of the main access areas are shown below from the top down. Note that some controls are at eye level, while others are at floor level.



(The "Tryer" is a small scoop used for sampling beans during roasting.)

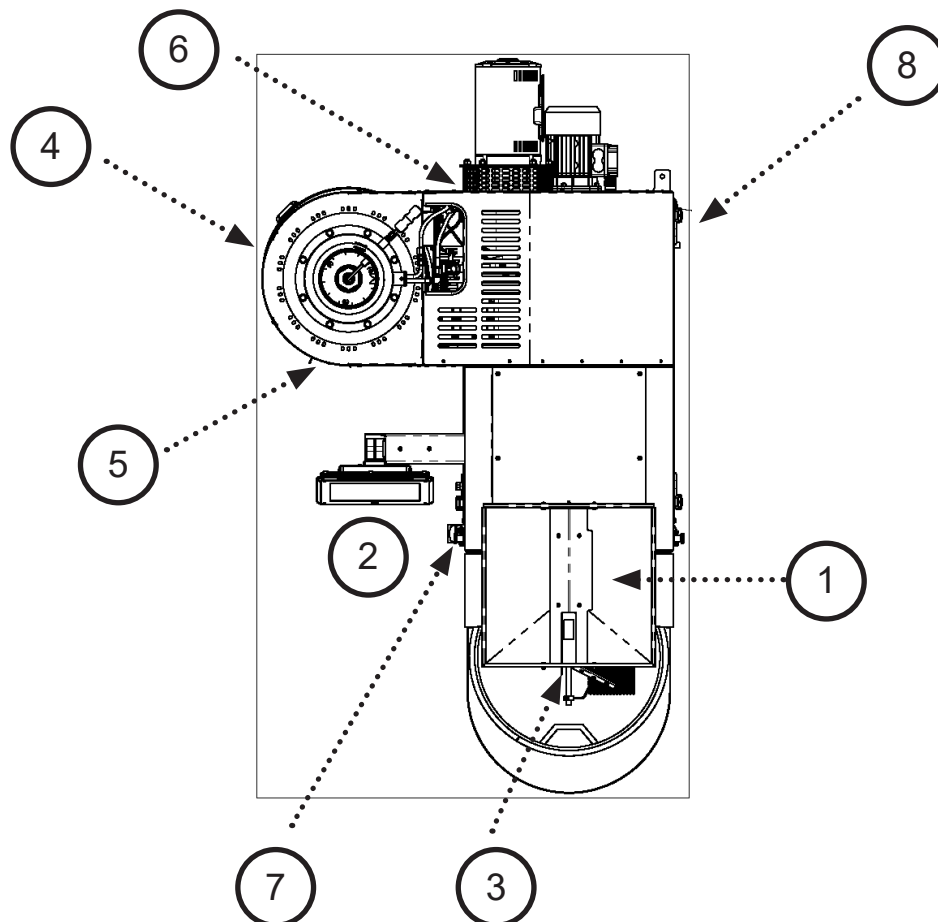
The tasks comprising daily roasting operations include:

Beans In, Beans Out. Roasting requires several points of access:

1. Load green beans into the Green Bean Hopper.
2. Go to the Operator Console Touchscreen (operator interface) to initiate a roast cycle.
3. During roasting, the operator may use the Tryer (a small sampling tray) to periodically inspect bean samples. After roasting, the beans are ejected into the Cooling Tray. The Cooling Tray is emptied and the roasted beans are transported to the next processing area.

Moving Parts. Other tasks require additional points of access:

4. The Chaff Barrel must be removed and emptied, sometimes several times a day.
5. In the event of ignition problems, the operator may also use the Cyclone's Sight Glass to view the interior of the Cyclone.
6. The utility valves for gas and water may be shut off at the end of daily operations.
7. The power on/off button is used to turn off the roaster at the end of daily operations.
8. The electrical disconnect may be used to completely remove power from the roaster at the end of daily operations.



## Lighting

A minimum level of lighting should be available on all sides of the roaster, at all levels including overhead and underneath.

## Network

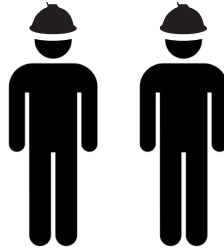
The roaster has the capability of connecting to an existing hard-wired Ethernet network. This allows you to monitor and control the roaster remotely from a desktop or laptop computer, email roaster data and machine fault reports, as well as upload, download and save Roast Profiles.

Customers must determine their own network configuration prior to final site commissioning, and must be able to provide this information to the Loring Field Service Technician.

# Receiving Shipment



Pallet Jack



2 People



Forklift

S7 Minimum Capacity 3000 lbs

## Shipping Notes

The customer is responsible for shipping arrangements, after notification from Loring that the roaster is ready to be picked up for shipping. In particular, the customer should comply with the following guidelines:

- Be sure to state that the roaster is to travel on a vehicle equipped with air ride suspension to dampen the vibration and minimize the chance of damage during shipment.
  - » For a cross-country shipment within the United States, Loring will not load the roaster equipment onto a trailer that does not have air ride suspension.
  - » For domestic shipments, request a nose / front load in order to minimize loading and unloading at multiple terminals along the way, which will reduce the opportunity for potential damage.
- Overseas customers are advised to use a Full Container Load (FCL) shipment as this will minimize the amount of transfers and handling by others.
- Handle the crates according to markings on crate for “This Side Up” and “Heavy End”.
- For safety, use 6’ forklift extensions.

Shipping the roaster according to Loring’s guidelines is required in order to maintain product warranty.

# S7 Shipping Crate

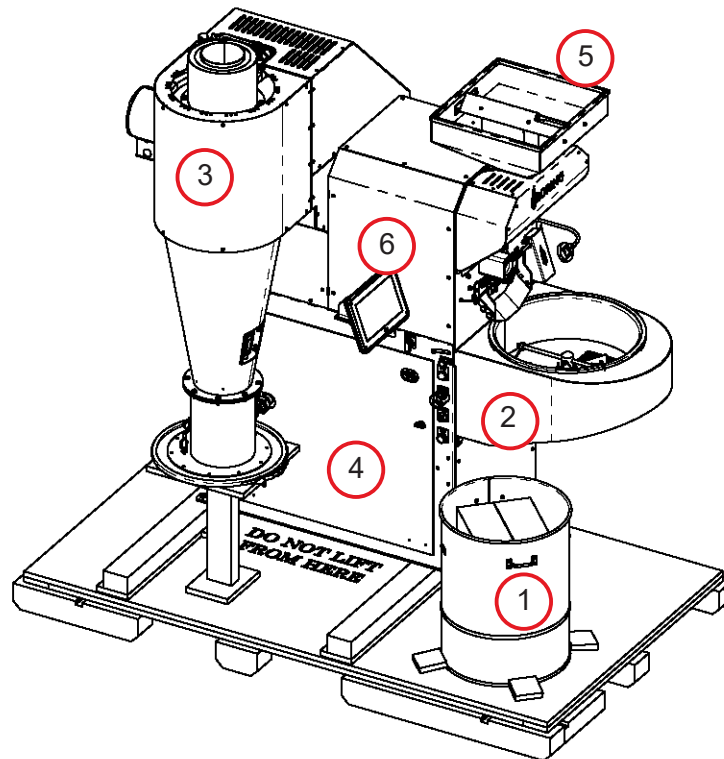
The S7 Roaster is shipped to domestic and overseas destinations in a single crate.

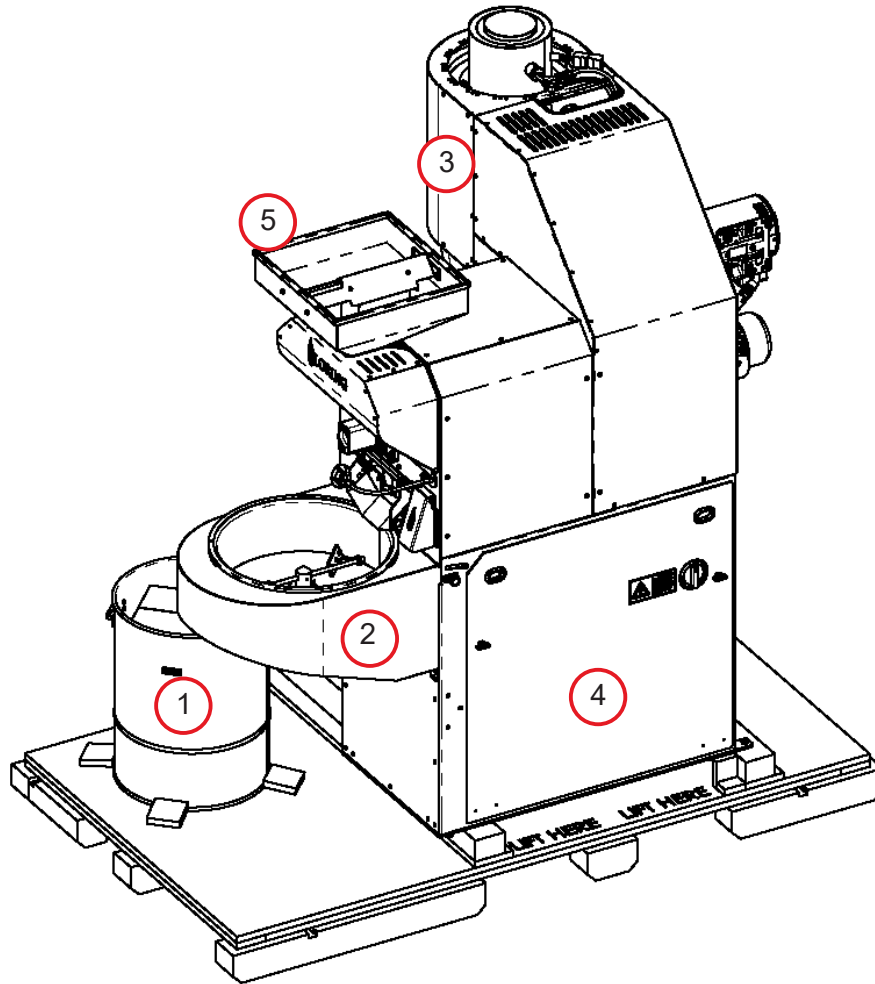
Crate dimensions and weight:

Length 78" (198 cm) Width 46" (117 cm) Height 85" (216 cm) Weight 1200 lb (544 kg)

## Items included in the crate

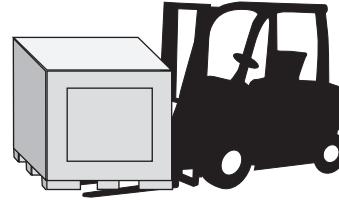
- ① Chaff Barrel
- ② Cooling Tray
- ③ Cyclone
- ④ Side Panels
- ⑤ Green Bean Hopper
- ⑥ Operator Console





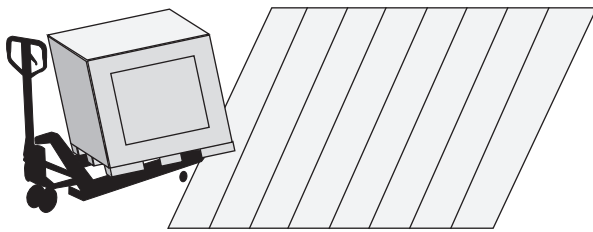
# Lifting and Moving the Roaster

## Off-Loading

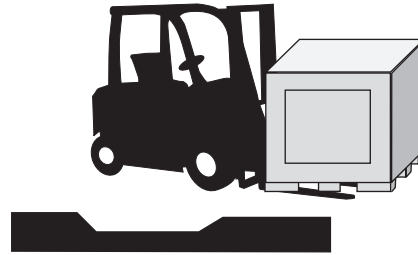


Use forklift rated for weight of crate + pallet

## Transporting

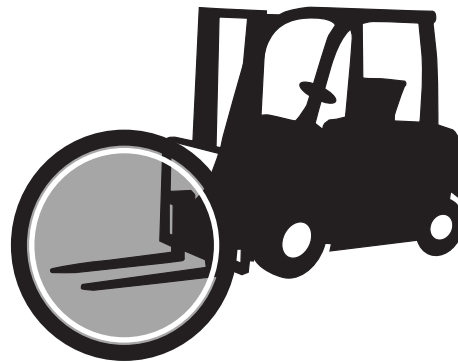
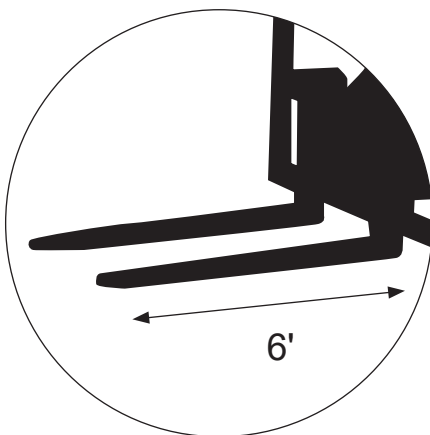


Use pallet jack for smooth surfaces

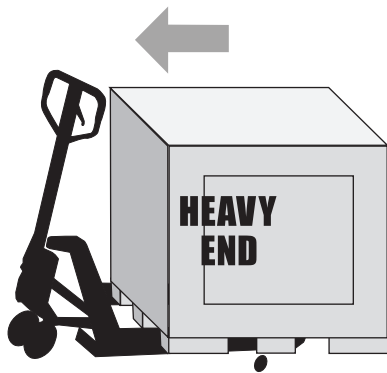


Use forklift for uneven ground with level changes

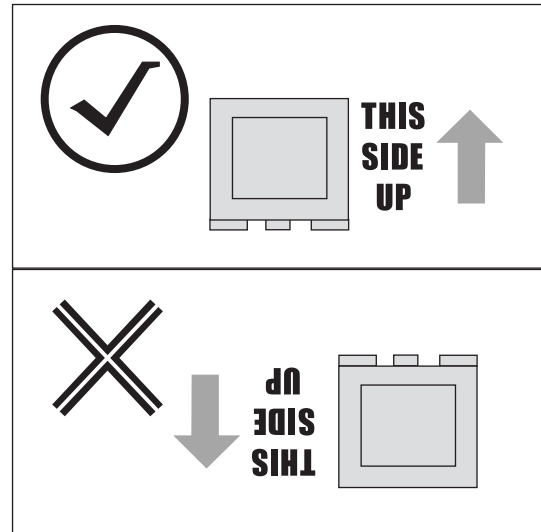
## 6' Fork Extensions



## Handling



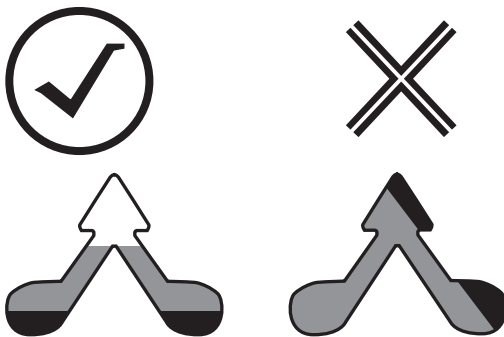
For side loading, always load “Heavy End” inwards



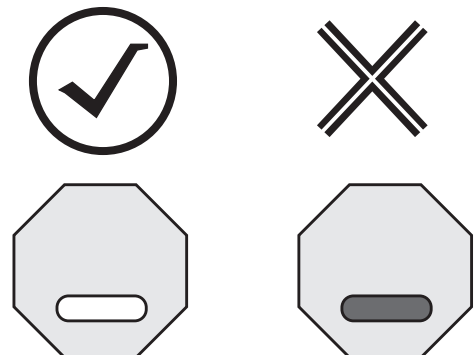
**WARNING:** Always keep shipping crates upright during handling and storage.

## Inspecting

Each crate ships with 2 shock indicators and 2 tilt indicators. Inspect crates for damage at time of delivery. Note any shipping damage on the Bill of Lading. Refer to the instructions on the indicators for detecting damage.

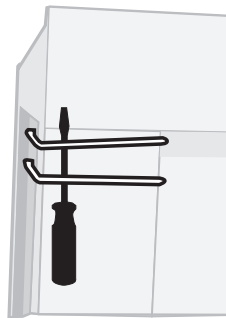


Tilt indicator shows color above line if crate has tipped

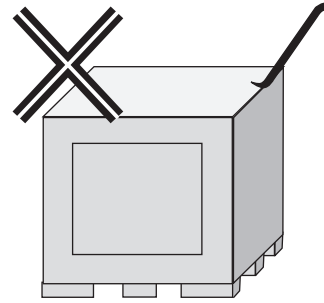


Shock indicator changes color if crate has been dropped or impacted

## Opening



Open crate using the clips provided

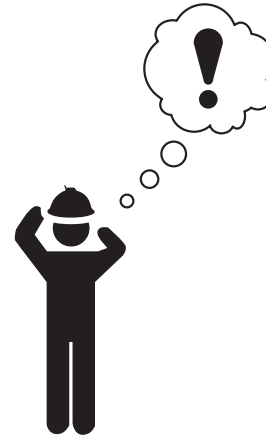


**CAUTION:** Do not pry open the shipping crates.

## Transporting



Do not load "Heavy End" out, as crate may fall.



**WARNING:** Do not drop the roaster.

# Next Steps

After confirming the shipping date with Loring, the customer should:

1. Review the *Assembly and Installation Guide* and the *Mechanical Interface Control Documents* (MICDs), available from Loring.
2. Provide the roaster model's *Pre-Installation Guide*, the *Assembly and Installation Guide*, a copy of the customer's completed *Product Specification Form*, and the *Mechanical Interface Control Document* drawings to the licensed contractor responsible for roaster assembly and installation.

## Site Preparation Checklist

Use the following informal checklist to ensure that the site is fully prepared:

- ☐ Building meets footprint and clearance requirements for selected roaster model
- ☐ Building doorways, elevators and corridors can accommodate the roaster
- ☐ Roaster location is clearly marked
- ☐ Stack hookup locations exist and are marked
- ☐ Site Detail/Construction Drawings are completed, accurate, and available
- ☐ Local code requirements are known, and have been addressed
- ☐ Required permits have been obtained
- ☐ Both the moving equipment and the final installation location can handle system weight
- ☐ Gas, and Electric Utilities have been measured and verified to be within required ranges

# Gas and Gas Supply

## Gas Connection Planning

Loring roasters can be fueled by either natural or propane gas. The gas supply pressure is the same for each roaster, but the gas volume is different between them.

Gas connections to the roaster must be made by a licensed contractor in accordance with all applicable local and regional regulations regarding installations of this type. It will be the responsibility of the contractor to not only be sure that the connections meet local code guidelines but also will supply the BTU/HR demand of the roaster. Improper connection type and pipe size will cause the roaster to perform poorly, potentially rendering it unusable. The gas contractor will be able to verify the potential BTU/HR of the supply system he installs based on pipe size, length, path and available pressure.

Provided straight out the back, down low on the roaster is an NPT pipe fitting, which is the inlet to the burner assembly. There is a shutoff valve provided at the roaster as well as a gauge for monitoring the incoming gas pressure.

A separate regulator may be required to feed the roaster if the upstream pressure is too high.

Multiple fittings or a long path may reduce flow, which must be taken into consideration.

It is vital to the proper operation of the roaster as well as the safety and legality of the system that proper care and planning go into the gas supply system.

## Gas requirements

### Caloric Content

In order to provide adequate roasting performance, Loring roasters require that the gas supply maintain a minimum caloric level.

- Natural gas: 1000Btu/ft<sup>3</sup> (37 MJ/m<sup>3</sup>) or greater
- Propane: 2500Btu/ft<sup>3</sup> (93 MJ/m<sup>3</sup>) or greater

This is critical to the proper operation of the roaster. Confirm with your gas supply company that the minimum caloric content is supplied and constant.

## Operating gas pressure

In order to provide proper burner operation, it is critical that a constant operating pressure is available. Loring roasters require the following pressures to operate in all situations.

- Natural gas: 4 in.WC to 7 in.WC (1.0 kPa to 1.7 kPa)
- Propane: 11 in.WC to 13 in.WC (2.7 kPa to 3.2 kPa)

A regulator or a combination of regulators may be needed to attain the proper operating pressure.

## Propane Fuel Installation Specifications

BTU minimum requirements of the Loring S7 roaster.

S7 Nighthawk requires an 80,000 BTU/h (20K kcal/h) gas supply.

Note: These are peak BTU requirements and the average can be less, based on usage.

BTU/hr delivery is based upon 11" water column (WC) (2.7 kPa) dynamic flow with a maximum of 13" WC (3.2 kPa).

### Components of a Propane System:

- Propane Tank(s)
- 3/8" (0.95 cm) x 3' (91 cm) long flexible gas line(s) (hog-tail, depending on how many tanks are in the manifold)
  - » POL TEE(s) if making a manifold
  - » Additional 3/8" (0.95 cm) x 3' (91 cm) long flexible gas line(s) (hog-tail, depending on how many tanks are in the manifold)
- Hi Pressure Regulator 10 PSI (70 kPa)
  - » Sometimes an additional 2 PSI (14 kPa) regulator is required
- Low Pressure Regulator 11" WC (2.7 kPa)
- Gas Pipe properly sized for distance between regulators and BTU/hr requirement
  - » Flexible gas line 1/2" (1.27 cm) x 3' (91 cm) for S7
- Gas Meter (sometime required to meet Permit Conditions)

# Natural Gas Installation Specifications

BTU minimum requirements of the Loring S7 roaster.

- S7 Nighthawk requires 80,000 BTU/h (20K kcal/h) gas supply

BTU delivery is based upon minimum 4" water column (WC) (1.0 kPa) dynamic flow with a maximum of 7" WC (1.7 kPa).

## Components of a Natural Gas System

- Utility Company supplying Natural Gas to your building
- Gas Regulator(s)
- Gas Meter
- Plumbing to Appliances

### Recommended Gas Supply System:

Gas supply to the outside of the building is always higher than the working pressure and needs to be regulated according to the specific demand.

Meter and regulator must be designed to handle 80,000 BTU/h (20K kcal/h) in addition to the other gas fired appliances that are on the same gas system. The regulator is to be set for 4" to 7" WC (1.0 to 1.7 kPa).

The Working Pressure Regulator is recommended to be less than 100 feet (30.5 m) and minimum of 3 feet (91 cm) from the roaster to reduce higher pressure to the minimum working pressure of 4" WC (1.0 kPa) to maximum 7" WC (1.7 kPa).

# Installing the Vent Stack

Exhaust gases are produced during the roasting process that need to be vented to the atmosphere. There are two sources of exhaust gas. Hot gas (products of combustion) through the cyclone assembly passes up into the “Hot Stack.” Also, air is drawn through the hot beans in the cooler tray to cool them passes through the “Cooling Stack.”

To keep rain out of the stack, caps must be attached at the exit of the stacks and any joints in the stack ducting must also be designed to keep rain out.

In general, a survey of the building will be made to determine where to position the roaster and how then to position the stack ducting to vent exhaust gases to the atmosphere. In the following pages are examples of common ducting configurations and techniques to provide ducting flexibility using the 45-degree vent kits.

## Hot Stack

The Hot stack connects to the top of the cyclone to the “Stack Hat” which is provided with the roaster. From this stack hat, you can attach to the customer supplied stack by welding, clamping, screwing, and riveting. The best connection is with a V-Band. No amount of leakage is acceptable.

The stack must be supported above and not resting on the roaster. Also, the effects of thermal expansion should be taken into account so that thermal growth does not put force on the roaster.

## Cooling Stack

The cooling stack will attach to the top of the cooler housing outlet, typically with a V-Band to a flange fitting, or at the preference of the customer and contractor may be attached by a variety of other methods. It is important that this connection is sealed but also easily removable for cleaning. The roaster may have the optional 45-degree offset kit, which does not alter the connection type, but allows for an easily removable and cleanable section.

## Roaster Placement

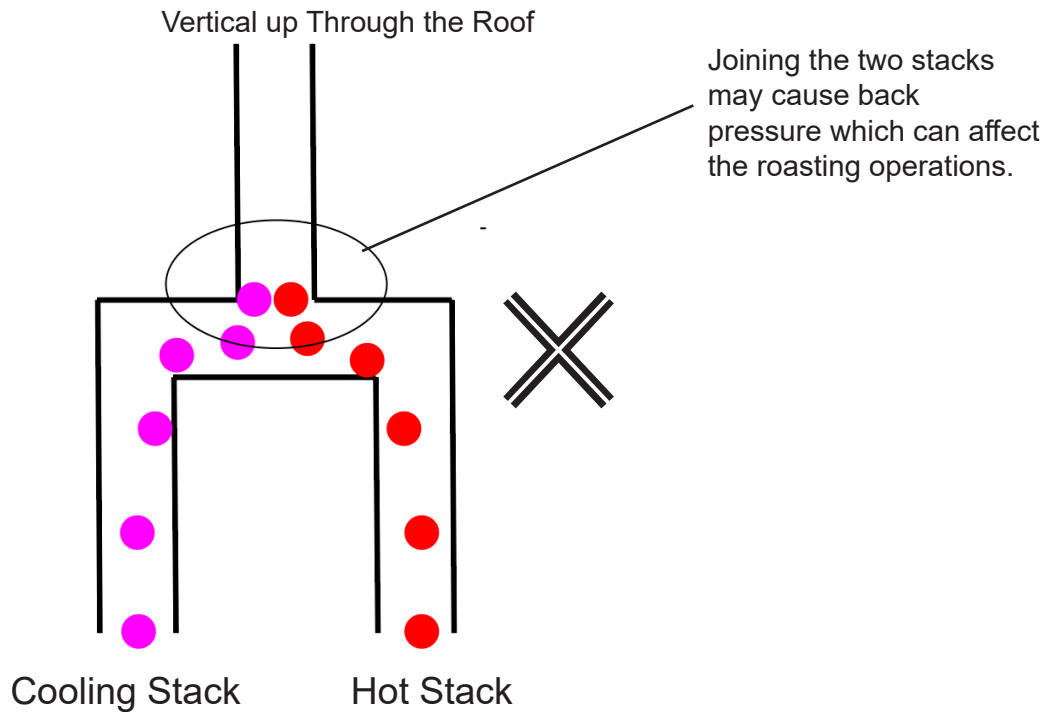
The roaster should be placed on a level, solid and cleanable work surface. The ball swivel mount leveling feet will allow the roaster to be leveled after it is put into position.

There may be regulations in your area which will mandate surface structure, anchoring, and minimum clearances.

## Getting Help

You will need to refer to your ventilation contractor for the preferred method of attachment. In turn, your ventilation contractor will need to be sure to comply with all applicable local and regional regulations regarding installations of this type.

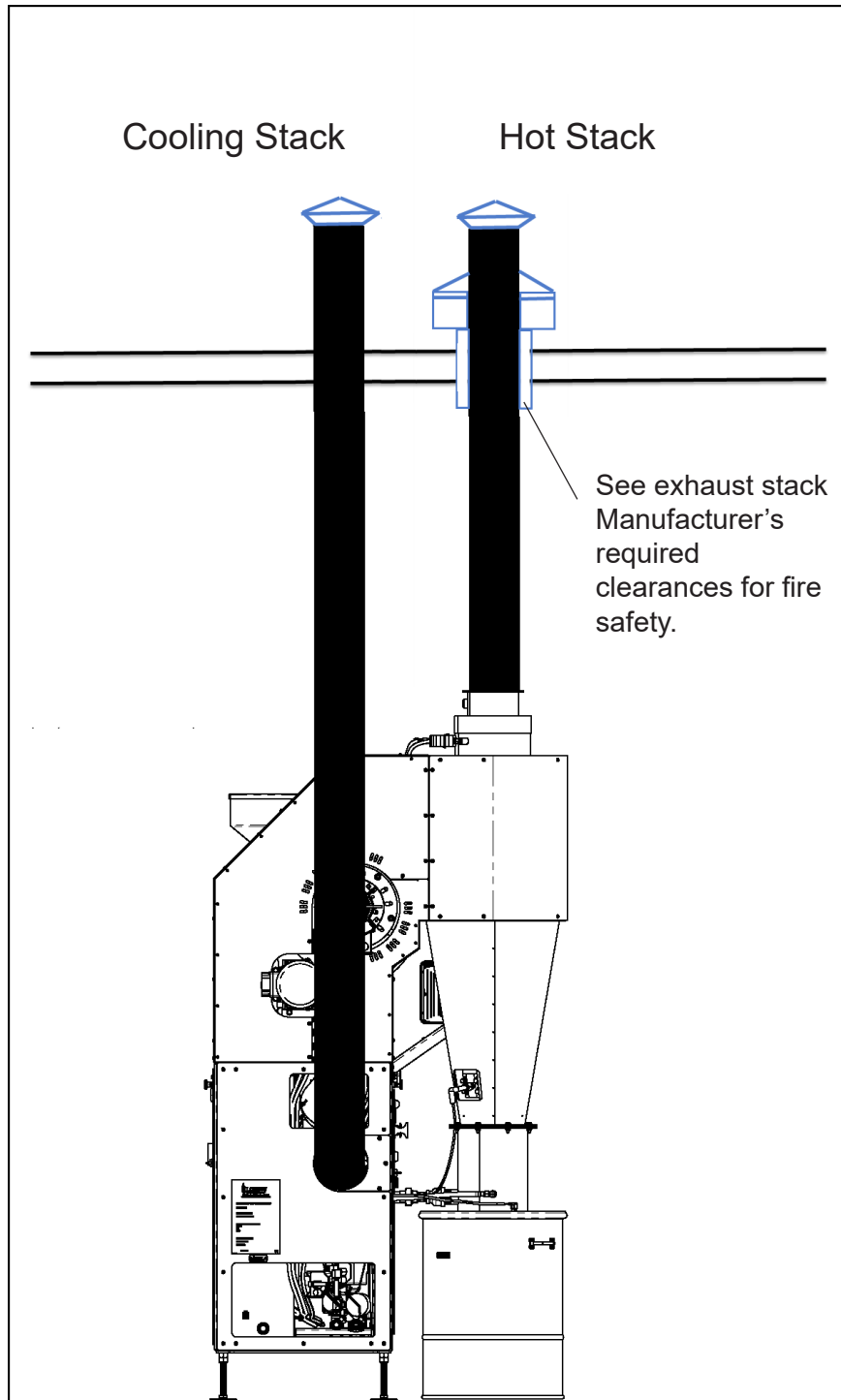
## Connection to be avoided



# Vent Stack Configurations

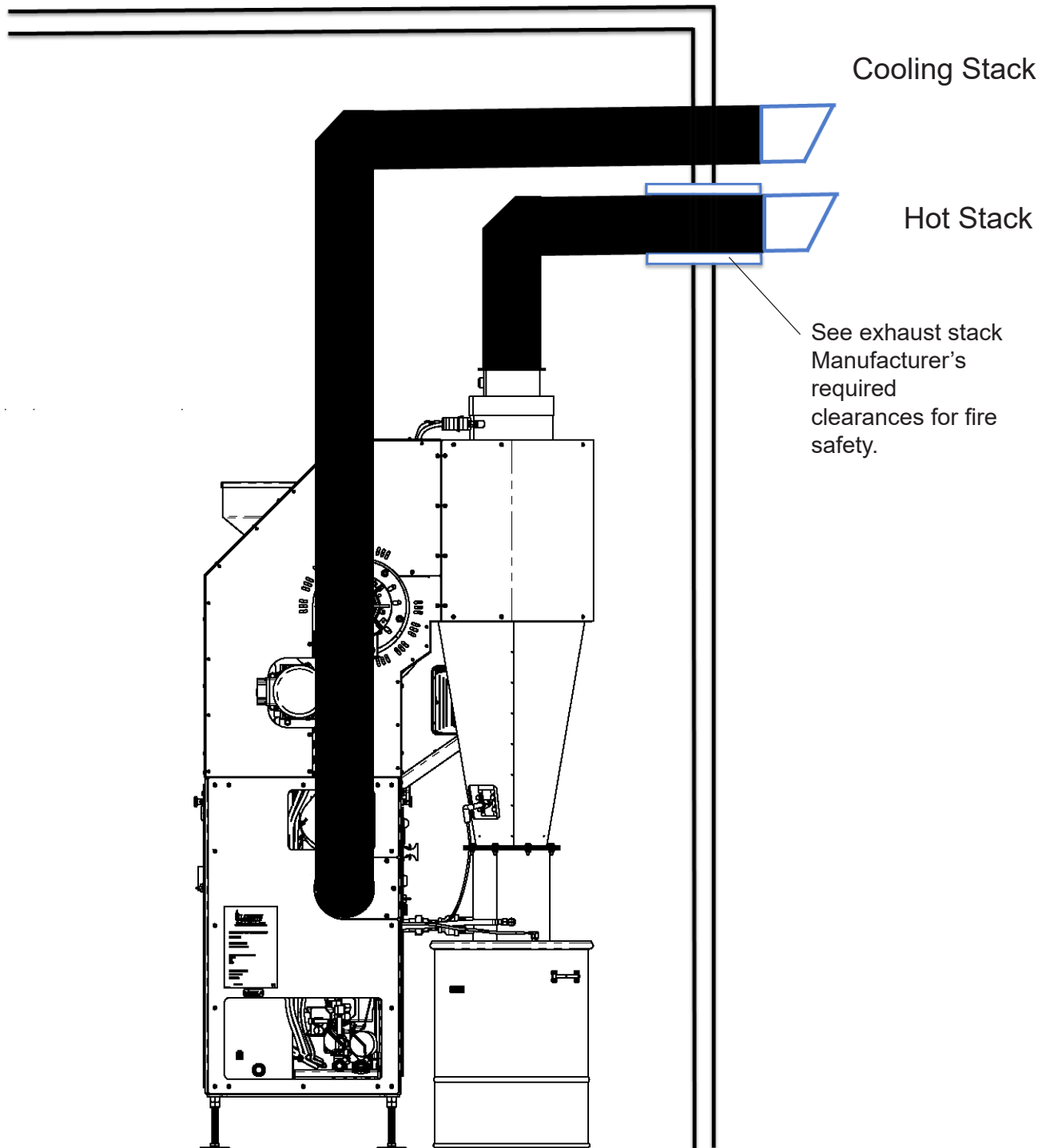
## Vertical up Through the Roof

Note: See Stack Manufacturer's documentation for required clearances when installing the stacks.



## 90-Degree Horizontal Through the Wall

Note: See Stack Manufacturer's documentation for required clearances when installing the stacks.



# Manufacturer Contact Information

This equipment is manufactured by:

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(707) 526-7215

For questions, please contact Loring Customer Support:

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(707) 526-7215 ext. 217  
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