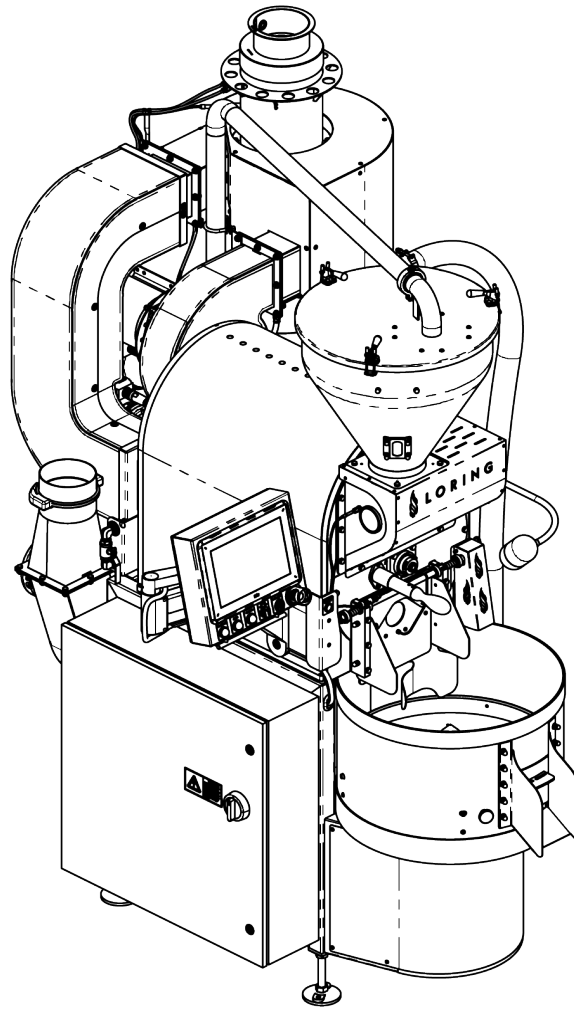




L O R I N G



Pre-Installation and Site Preparation Guide

Loring S15 FalconTM Coffee Roaster

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Notices

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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.

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Introduction

Audience

The intended audience for this manual, the *S15 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.

S15 Specifications

Table 1. S15 Basic Equipment Specifications

S15 Specification	Value
System Weight ¹	1404 lb (637 kg) uncrated
Maximum Batch Size	33 lb (15 kg)
Minimum Batch Size	6.6 lb (3 kg)
Nominal Electrical Power	3.26 kW*
Peak Electrical Power	4.33 kW*
Maximum BTU Rating	130,000 BTU/hr (33 K kcal/h)
Hot Stack Max Continuous Temperature ²	1400 °F (760 °C)
Hot Stack Max Intermittent Temperature ²	1500 °F (816 °C)
Hot Stack Max Flow ³	22 dscfm (37 dsm3/h)
Hot Stack Max Flow (Peak Air Cool) ⁵	310 dscfm (527 dsm3/h)
Hot Stack Minimum Duct Diameter ⁴	6 in (152 mm)
Cooling Exhaust Max Flow ⁵	980 scfm (1670 sm3/h)
Cooling Duct Diameter ⁴	6 in (152 mm)

* power value includes all motors running

Requirements for Utilities

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

Table 2. S15 Utilities Requirements

S15 Specification	Value
Water Supply (Flow) Minimum	1 GPM (3.8 LPM) or greater
Water Pressure Minimum	50 psi (345 kPa) or greater
Natural Gas Pressure (Min/Max Range)	4 - 7 in WC (1.0 - 1.7 kPa)
Natural Gas Caloric Content, Minimum	1000 BTU/ft ³ (37 MJ/m ³) or greater
Propane Gas Pressure (Min/Max Range)	11 - 13 in WC (2.7 - 3.2 kPa)
Propane Gas Caloric Content, Minimum	2500 BTU/ft ³ (93 MJ/m ³) 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

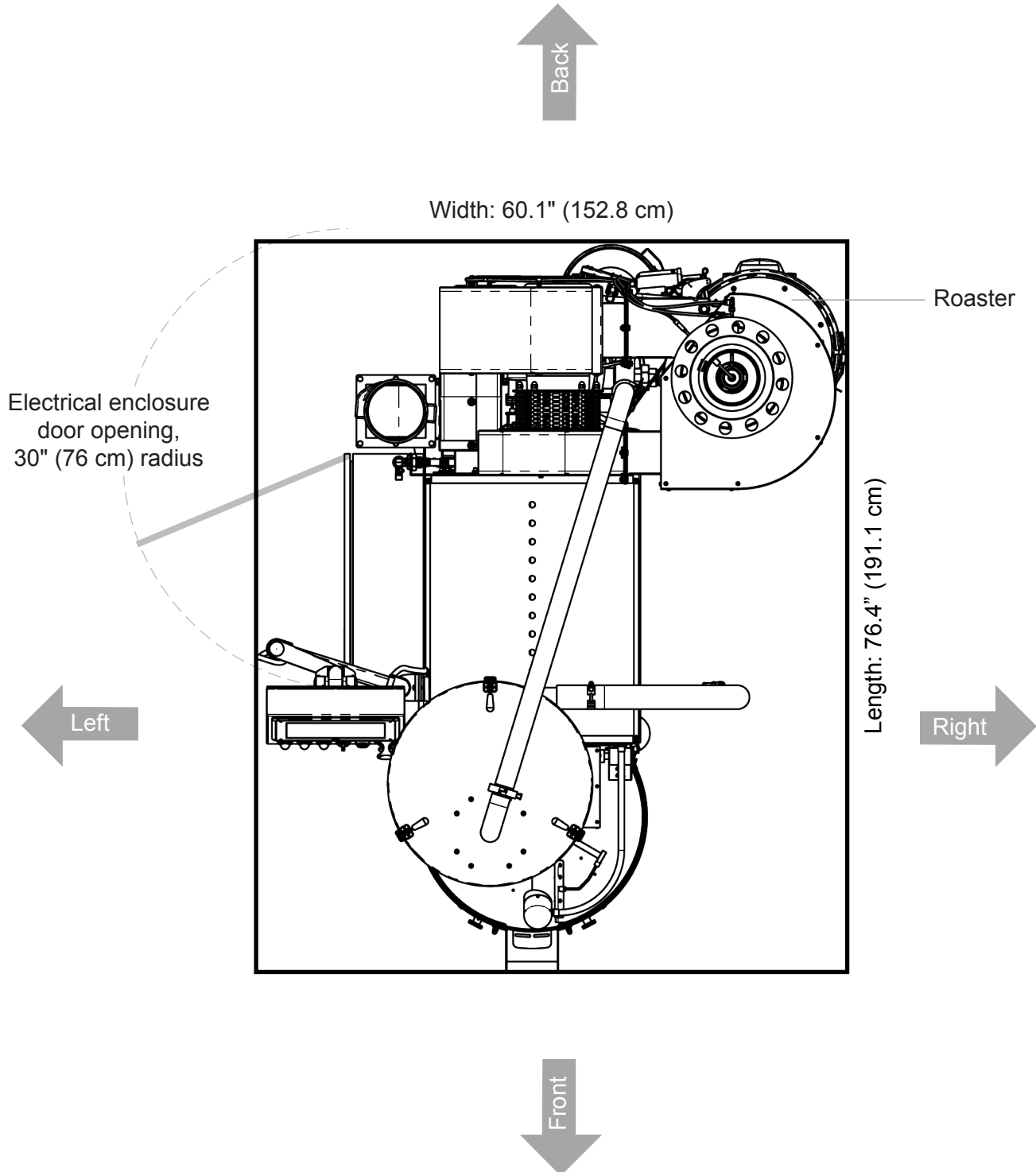
Overall Footprint

Table 3. S15 Dimensions and Clearances

S15 Dimension	Value
Footprint (Roaster only)	60" W x 76" L x 92" H (153 cm W x 194 cm L x 232 cm H)
Clearance	30" left, 36" right, 26" front, 12" in back (76 cm left, 91 cm right, 66 cm front, 31 cm back)
Roaster Height	92" (232 cm)
Minimum Ceiling Clearance	12" (31 cm) above Stack Hat
Total Ceiling Height	104" (263 cm)

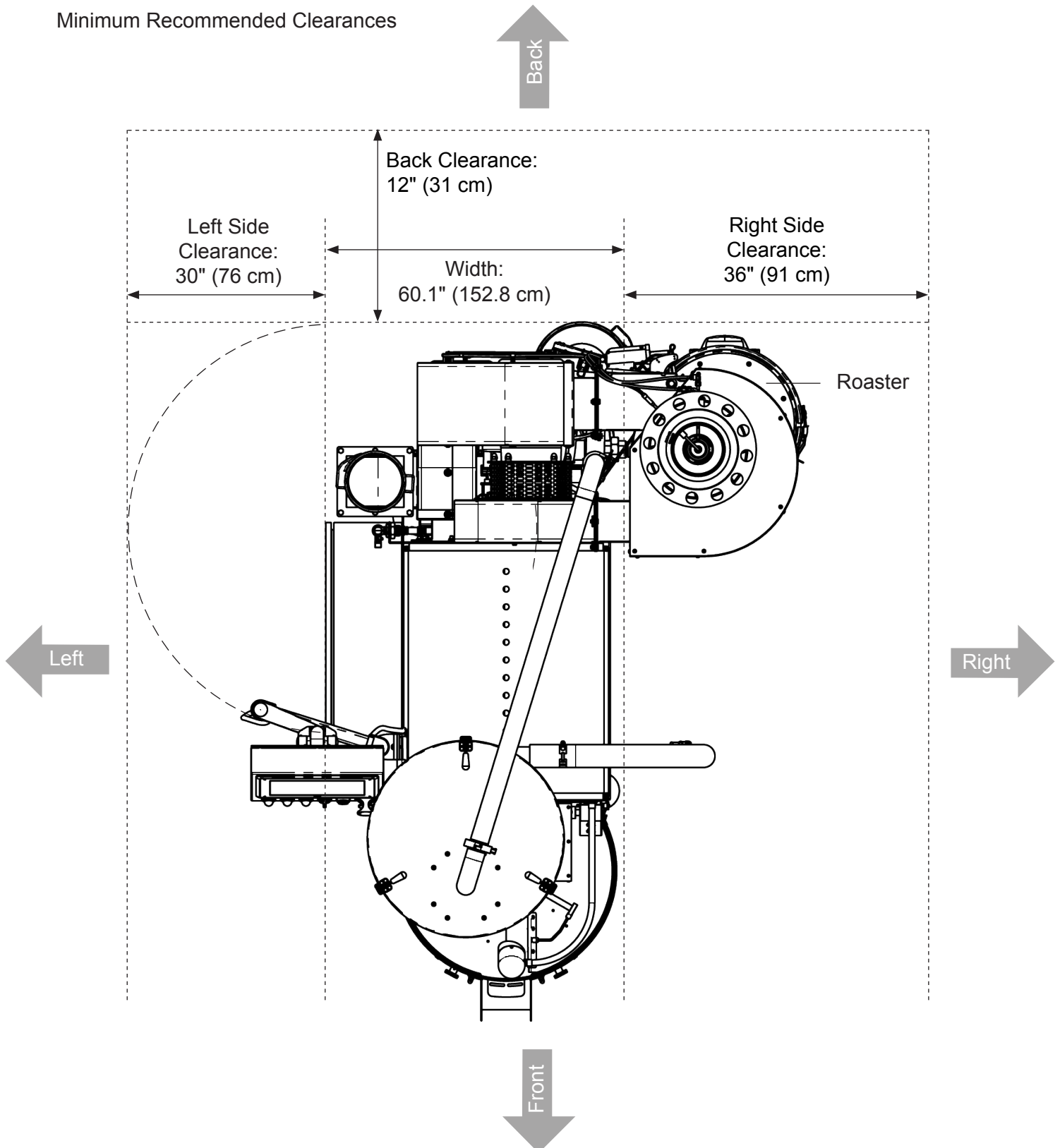
Refer to the *Mechanical Interface Control Document (MICD)* from Loring for further information, including CAD diagrams with construction details.

Footprint – S15 Roaster



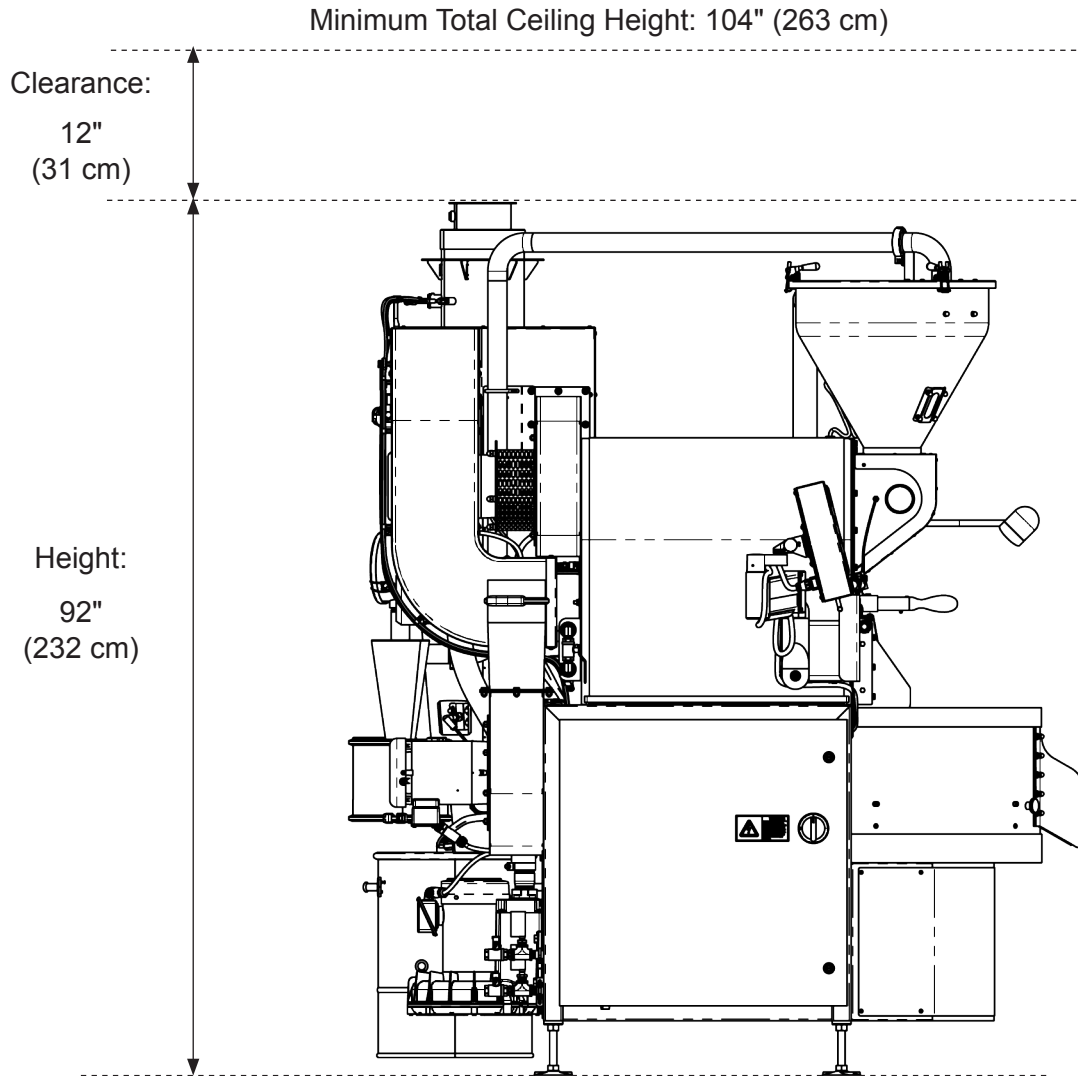
Floor Clearances – S15 Roaster

Minimum Recommended Clearances



Overhead Clearances – S15 Roaster

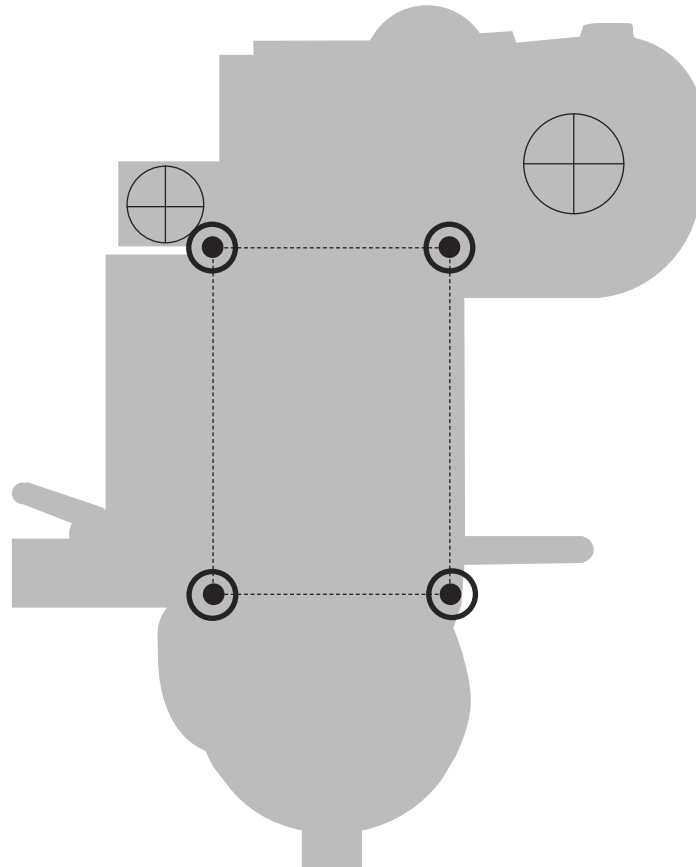
Minimum Recommended Clearances



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 - S15 Roaster Feet

For dimensions of roaster feet spacing, contact Loring Support for the S15 MICD.
support@loring.com



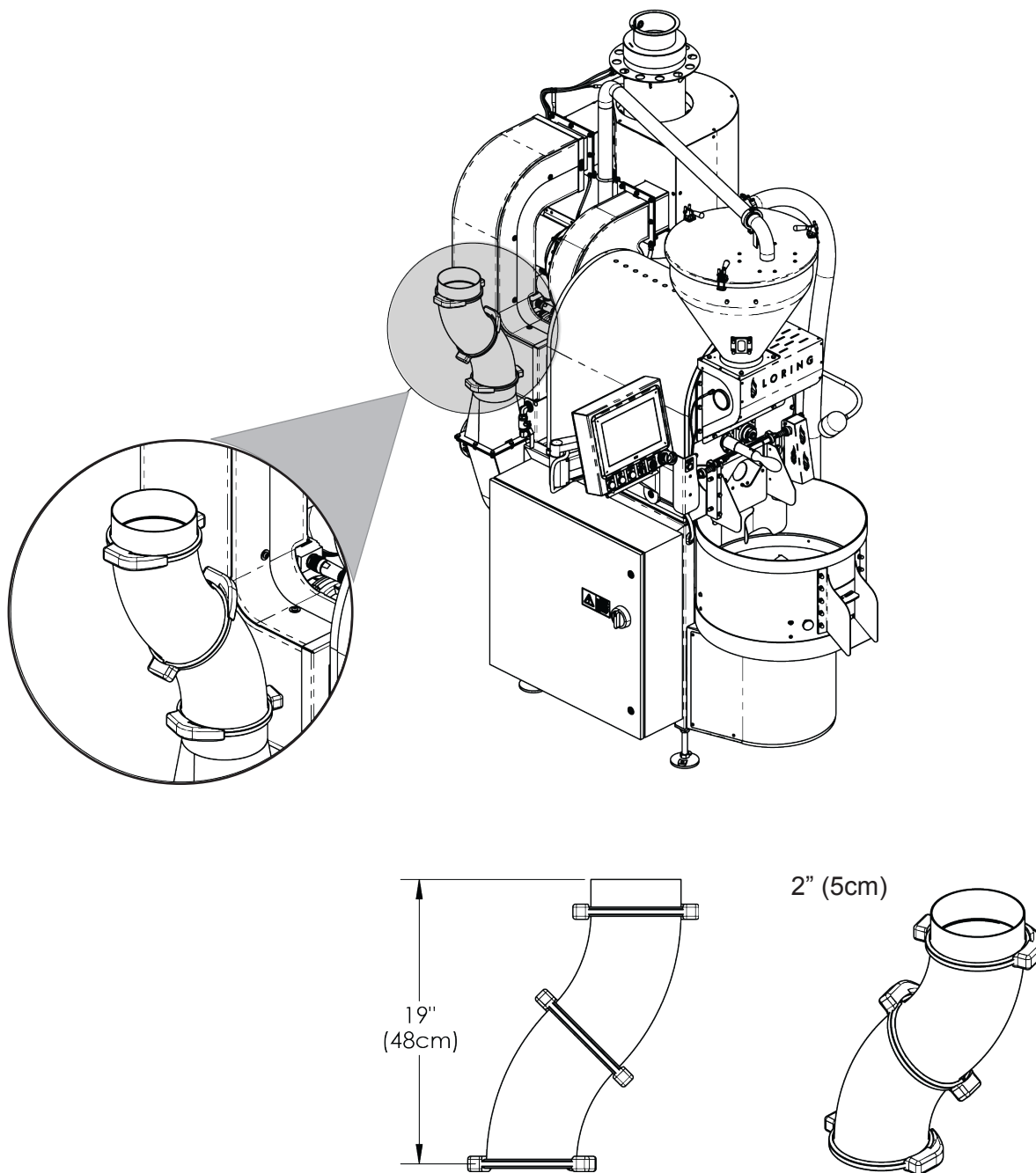
The roaster rests on 4 Roaster Feet, which support the entire weight of the roaster and allow for leveling on uneven floor surfaces. The floor must be able support the concentrated weight.

Note: The approximate weight of the S15 roaster is 1404 lb (637 kg). All of this weight is concentrated in the 4 Roaster Feet that are under the roaster body itself.

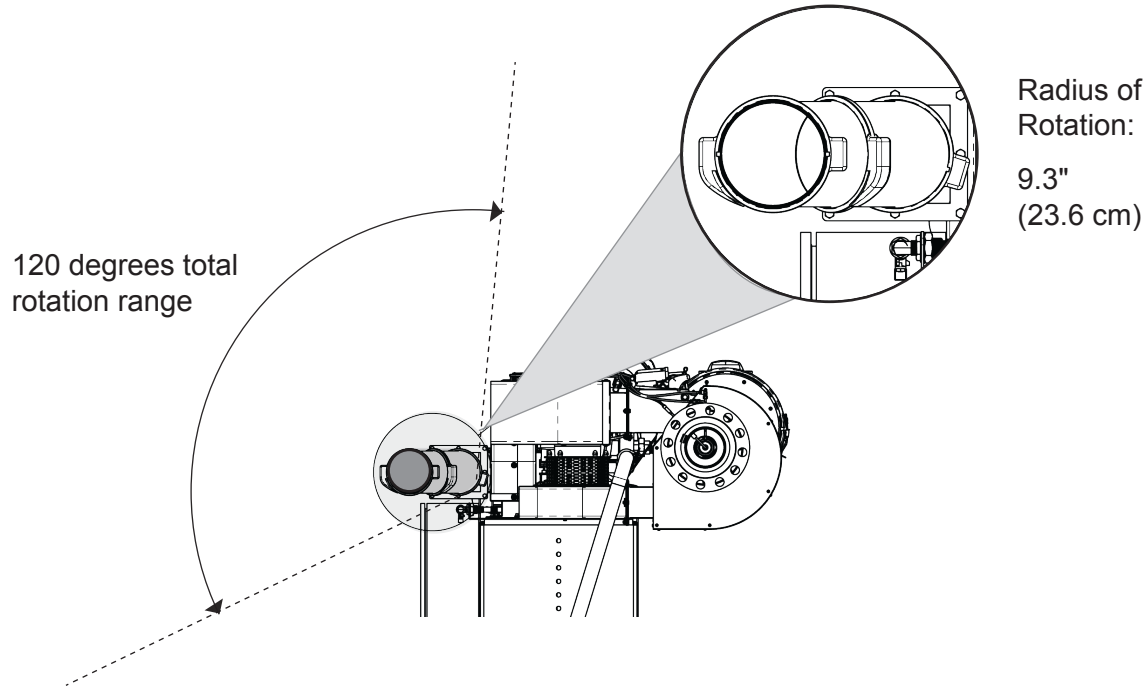
45-Degree Vent Kit

The 45-Degree Vent Kit is an optional 2-piece component set for the Cooling Exhaust Vent that acts as an extender. It provides additional range for positioning the exit point, including rotating around the roaster attachment point, and can be removed to facilitate cleaning of the Cooling Vent.

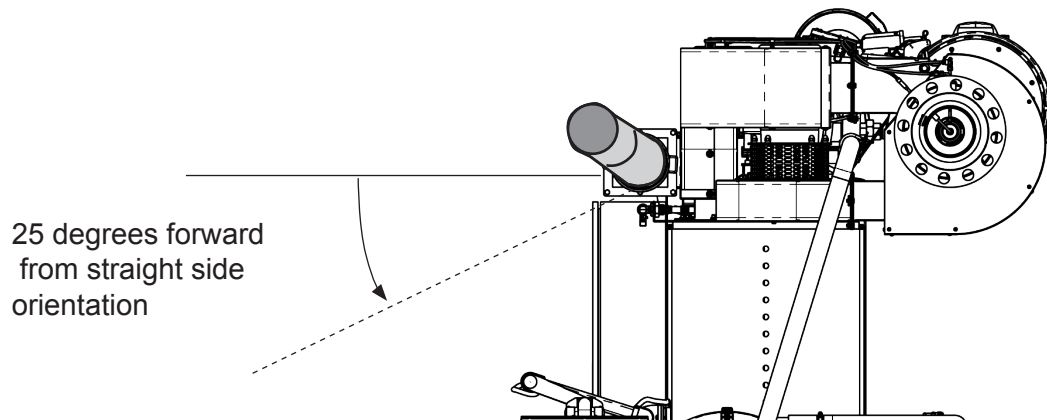
This kit is a special order item. If needed, it is shipped with the roaster in the Accessory crate.



45-Degree Vent Kit Rotation



Top Down Views



Space Planning

Indoors

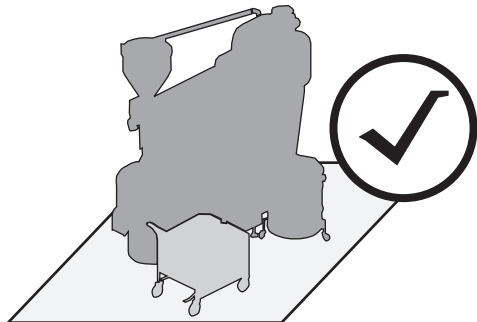
Locate the coffee roaster in an area that is protected from the elements and from water intrusion. The area does not need to be a fully conditioned space.

The area should be well ventilated and capable of providing 1290 scfm (peak) make up air.
(See Table 1 for details)

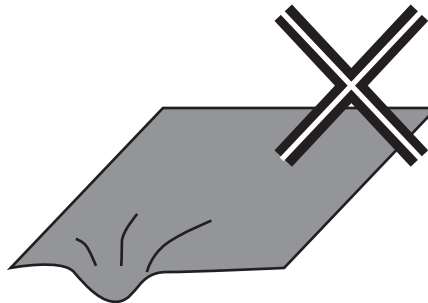
The space should also allow adequate room for daily operational work flow, servicing the roaster and the movement/ nearby storage of green and roasted beans.



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

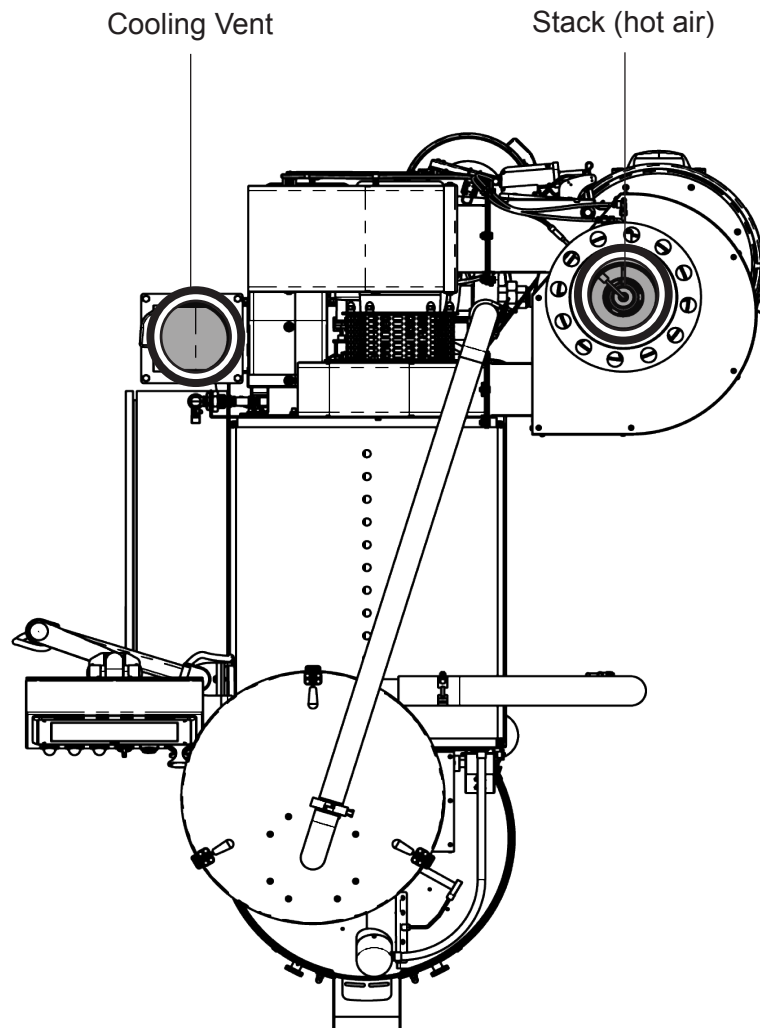
The ventilation stacks connect to openings in the wall or roof. An optimal location is directly above the corresponding stack connections on the roaster.

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

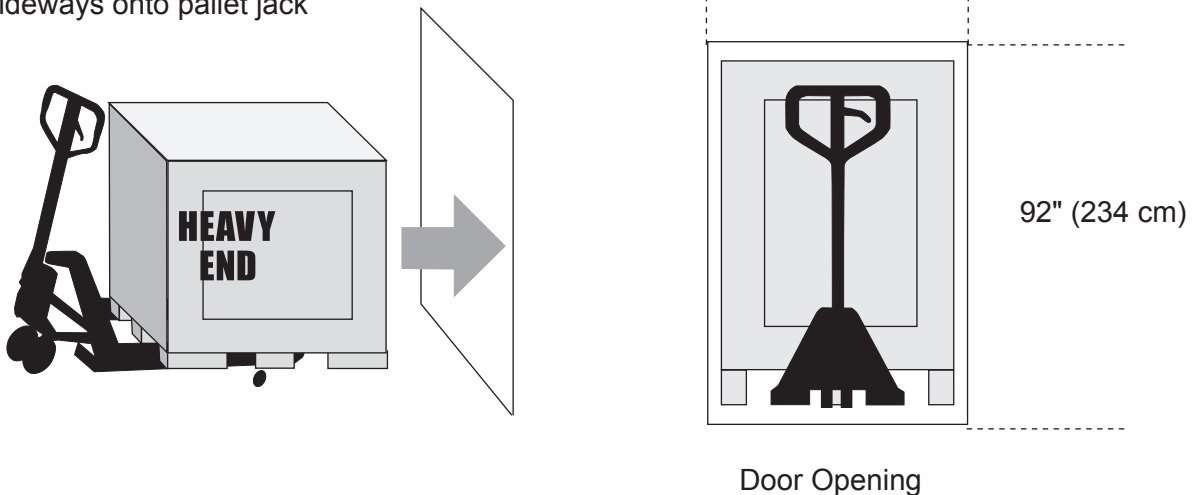
Customers must consider not only the room where the roaster will be installed, but also any openings or corridors that the roaster equipment must fit through during transport and assembly.

Generally speaking, the smallest opening for the S15 (crated) 92" (234 cm) tall by 60" (153 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 S15 crating dimensions go to [S15 Shipping Crate on page 27](#).

Minimum Recommended Door Opening for S15

For small openings, load crate sideways onto pallet jack



Crate Handling Dimensions:

Wide	51" (130 cm)
Long	99" (251 cm)
Height	89" (226 cm) + 3" (8 cm) for pallet jack
Weight	1665 lbs (755 kg)

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.

Room Size and Ventilation

The area should be well ventilated and capable of providing 1290 scfm (peak) make up air (see Table 1 for details). Otherwise, the performance of the roaster will be negatively impacted.

If the roaster is located in a small 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.

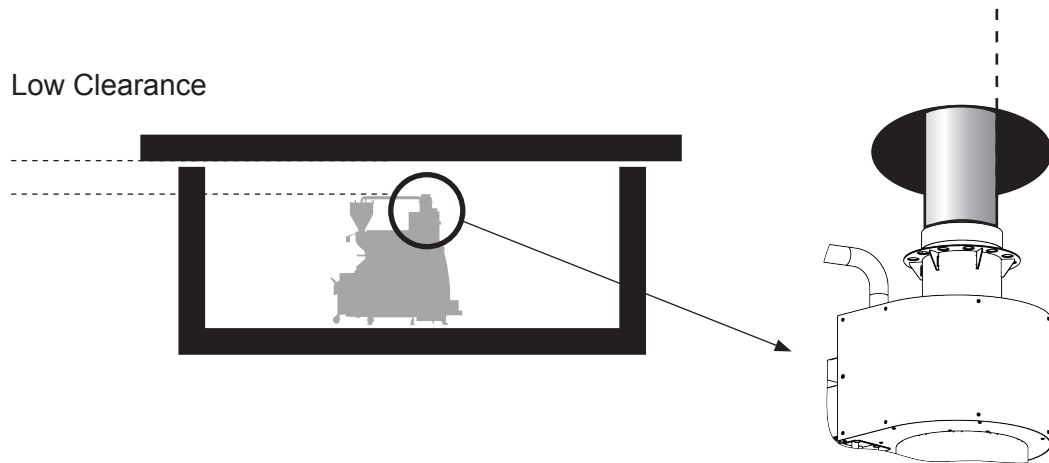
For the S15 roaster, the total air intake flow rate is the combination of the Hot Stack Max Flow (Peak Air Cool) and Cooling Vent Max Flow from Table 1. S15 Basic Equipment Specifications on page 9.



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

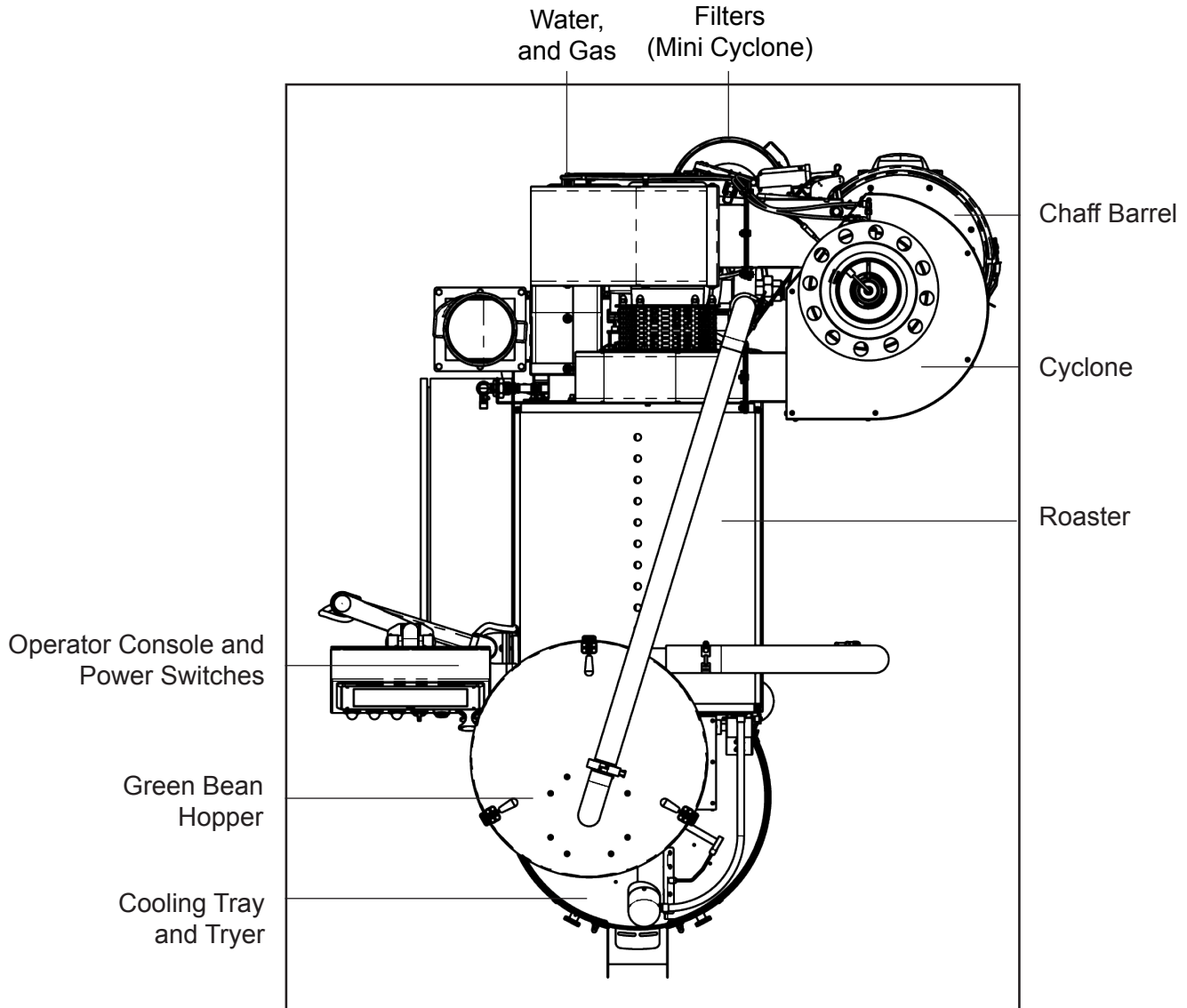
If the ceiling is taller than 15 feet, the stacks can go straight up and out of the roof, or they can bend after a certain height and exit the wall instead. This height may vary based on local regulatory requirements.

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.)

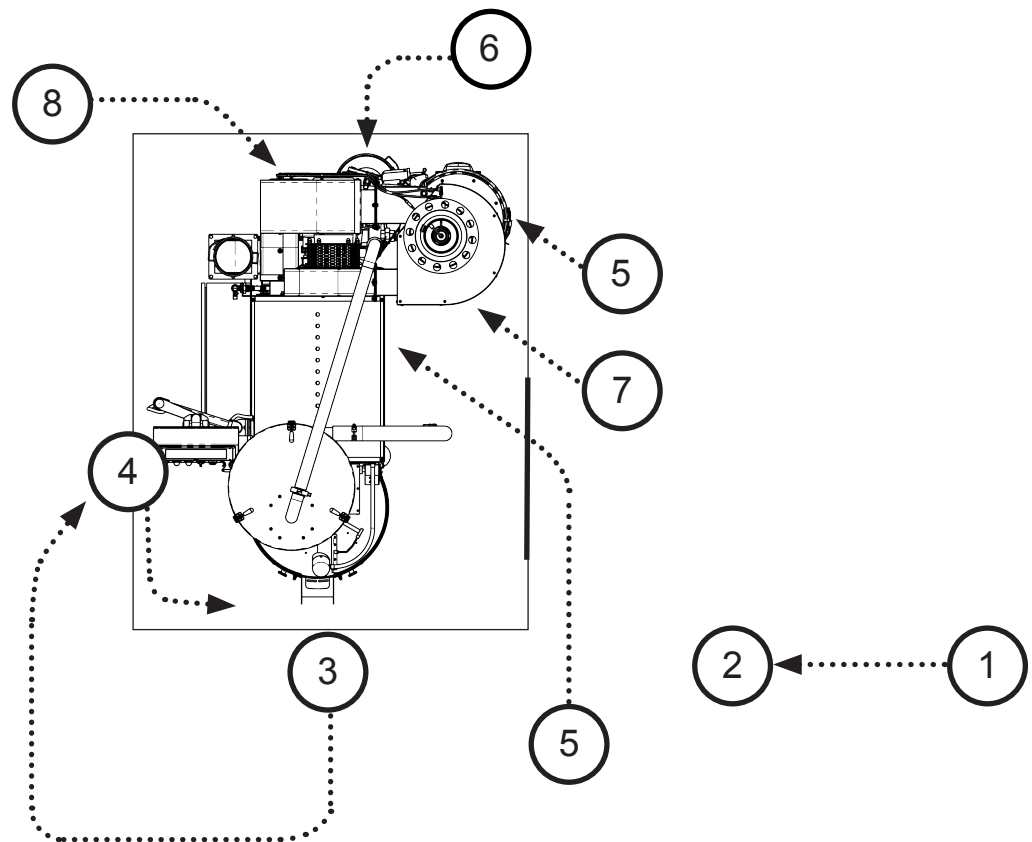
The tasks comprising daily roasting operations include:

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

1. Load green beans into the Green Bean Cart in green bean storage area.
2. Move Green Bean Cart over to roaster, and connect the Green Bean Hopper Vacuum Hose.
3. Go to the Operator Console Touchscreen (operator interface) to initiate a roast cycle. This includes vacuum-loading the green beans from the Green Bean Cart into the Green Bean Hopper above the roaster.
4. 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:

5. On the right of the roaster, the Chaff Barrel must be removed and emptied, sometimes several times a day.
6. Periodically, the filter in the back by the Mini Cyclone must be replaced.
7. In the event of ignition problems, the operator may also use the Cyclone's Sight Glass to view the interior of the Cyclone.
8. The utility valves for gas, and water may be shut off 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

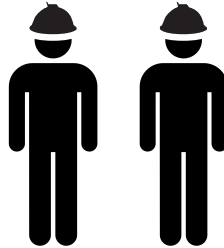
The roaster has the capability of connecting to an existing hard-wired Ethernet network. This allows you to monitor and control the roaster remotely from a desktop or laptop computer, email roaster data and machine fault reports, as well as upload, download and save Roast Profiles.

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

S15 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 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.

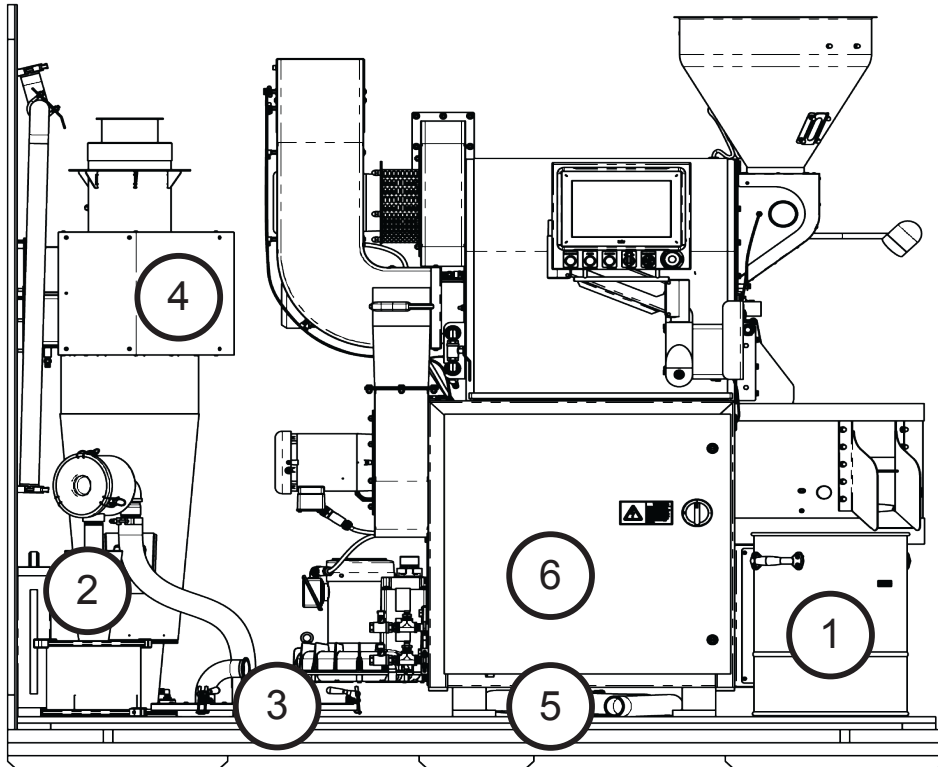
Shipping the roaster according to Loring’s guidelines is required in order to maintain product warranty.

S15 Shipping Crate

The S15 Roaster is shipped to domestic and overseas destinations in a single crate.

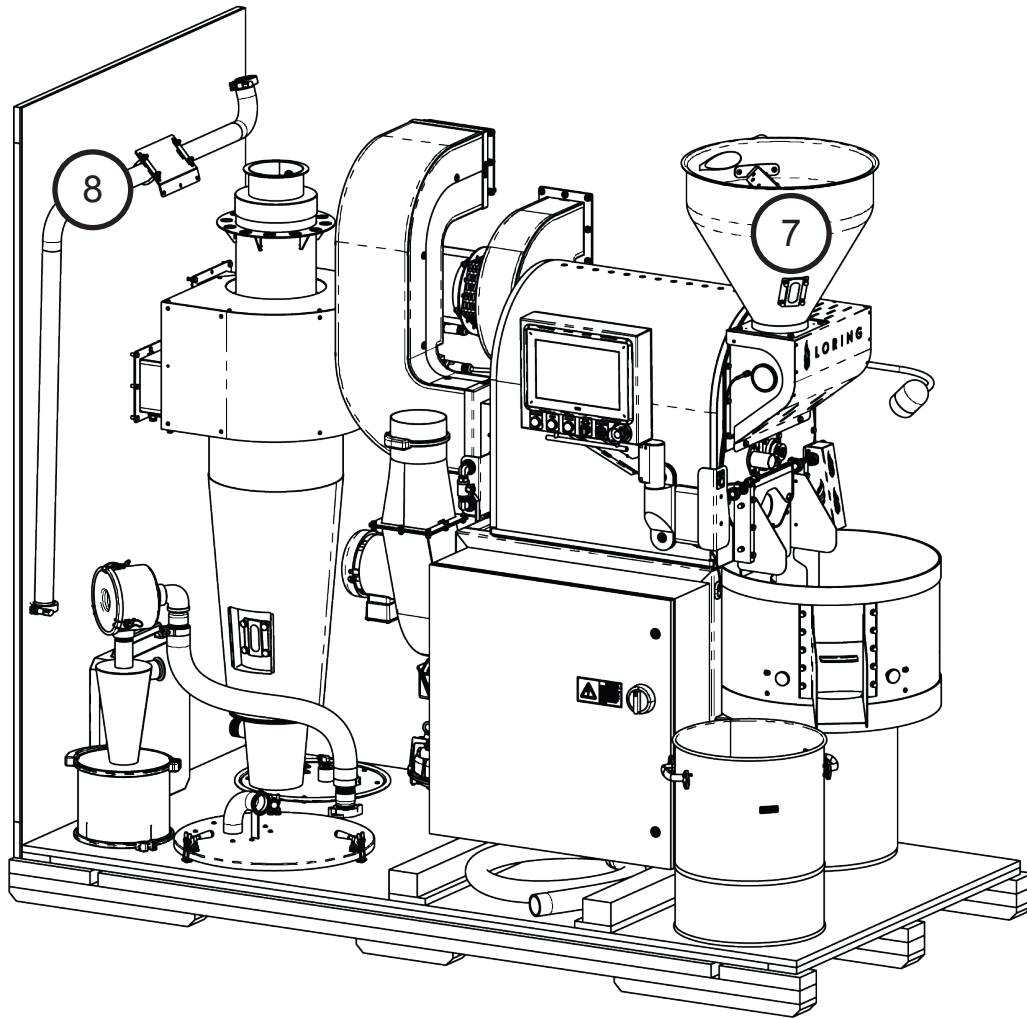
Crate dimensions and weight:

Length 99" (251 cm) Width 51" (130 cm) Height 89" (226 cm) Weight 1985 lb (900 kg).



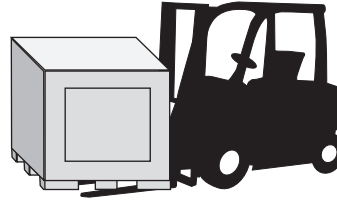
Items included in the crate

1. Chaff Barrel
2. Mini Cyclone
3. Green Bean Hopper Lid
4. Cyclone
5. Green Bean Vacuum Hose
6. Electrical Panel
7. Green Bean Hopper
8. Vacuum Tube (Attached to side wall).



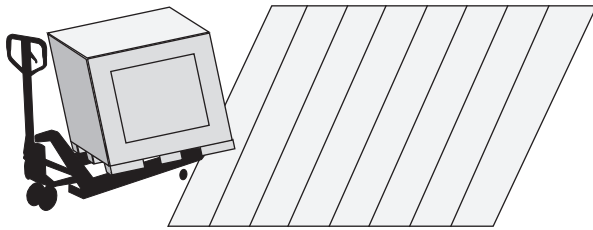
Lifting and Moving the Roaster

Off-Loading

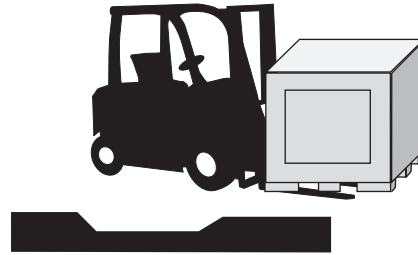


Use forklift rated for weight of crate + pallet

Transporting

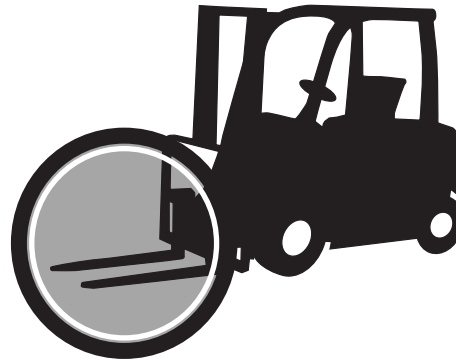
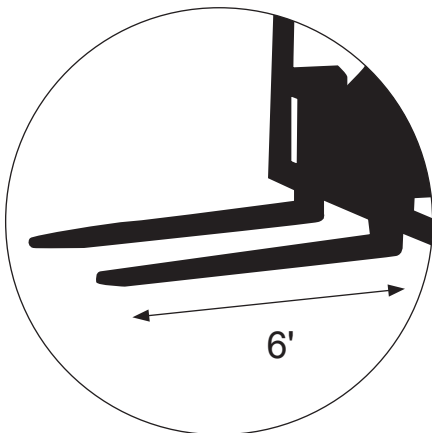


Use pallet jack for smooth surfaces

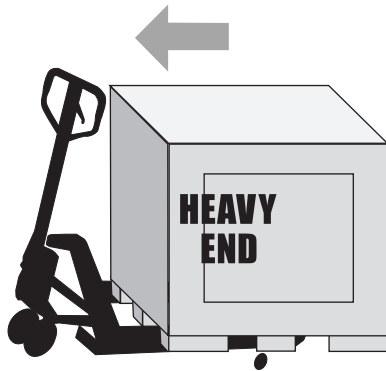


Use forklift for uneven ground with level changes

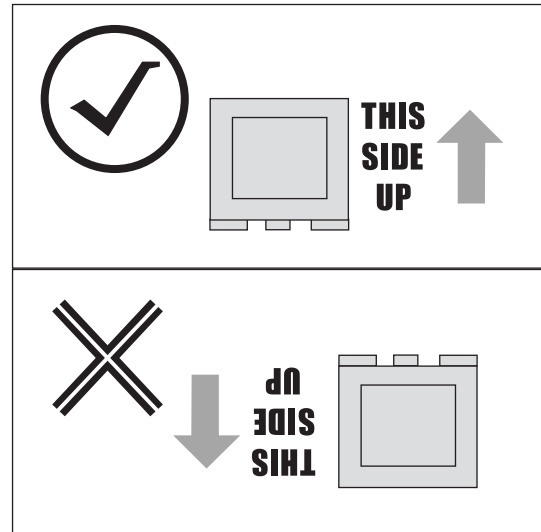
6' Fork Extensions



Handling



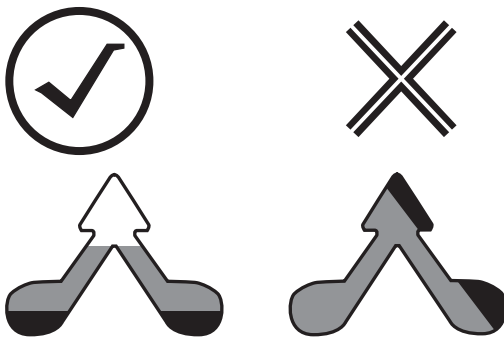
For side loading, always load “Heavy End” inwards



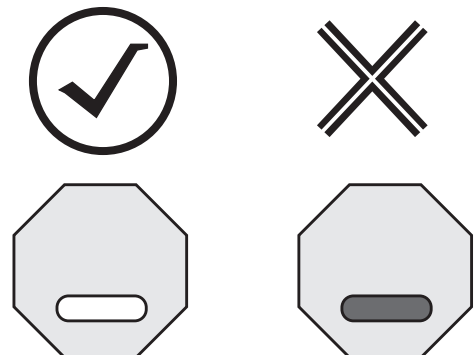
WARNING: Always keep shipping crates upright during handling and storage.

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.

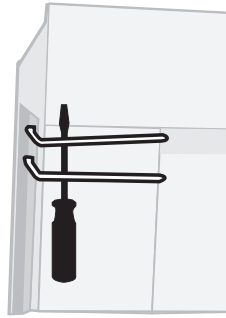


Tilt indicator shows color above line if crate has tipped

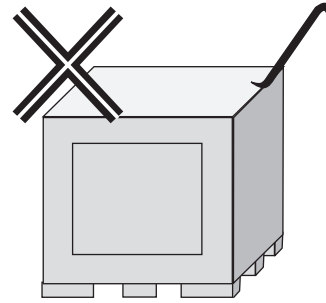


Shock indicator changes color if crate has been dropped or impacted

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
- ☐ Destoner position has been determined and marked, if applicable
- ☐ 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.

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/ft³ (37 MJ/m³) or greater
- Propane: 2500Btu/ft³ (93 MJ/m³) 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 S15 roaster.

S15 Falcon requires a 130,000 BTU/hr (33K kcal/h) gas supply.

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

BTU 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 3/4" (1.9 cm) x 3' (91 cm) for S15)
- Gas Meter (sometime required to meet Permit Conditions)



Natural Gas Installation Specifications

BTU minimum requirements of the Loring S15 roaster.

- S15 Falcon requires 130,000 BTU/hr (33K 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.

The distance from the meter to the roaster will determine if more than one regulator is needed. If a first and second stage regulator is required, typically the first regulator is set for 2 PSI and the second regulator is set for working pressure of 4" to 7" WC (1.0 to 1.7 kPa).

Meter and regulator must be designed to handle 130,000 BTU/hr (33K kcal/h).

Second Regulator or Working Pressure Regulator must be less than 100 feet (30.5 m) and more than 10 feet (3 m) 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).

Recommended Natural Gas Working Pressure Regulator: Sensus 143-80-2 with ½" (1.3 cm) orifice and Blue Spring with appropriate pipe inlet and outlet size. After installation, adjust working pressure of 5" WC (1.2 kPa) to 8.5" WC (2.1 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 is passed up 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, riveting and caulking. The best connection is with a V-Band. No amount of leakage is acceptable.

The stack must be supported above and not by 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

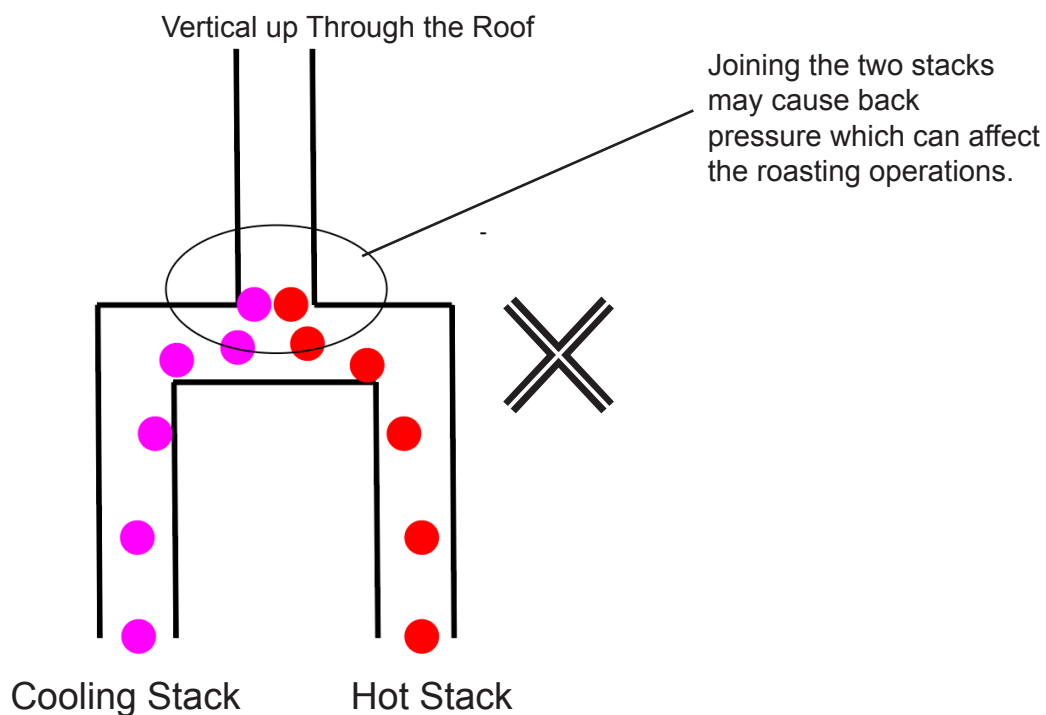
The roaster should be placed on a level, solid and cleanable work surface. The ball swivel mount leveling feet will allow the roaster to be leveled after it is put into position.

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

Getting Help

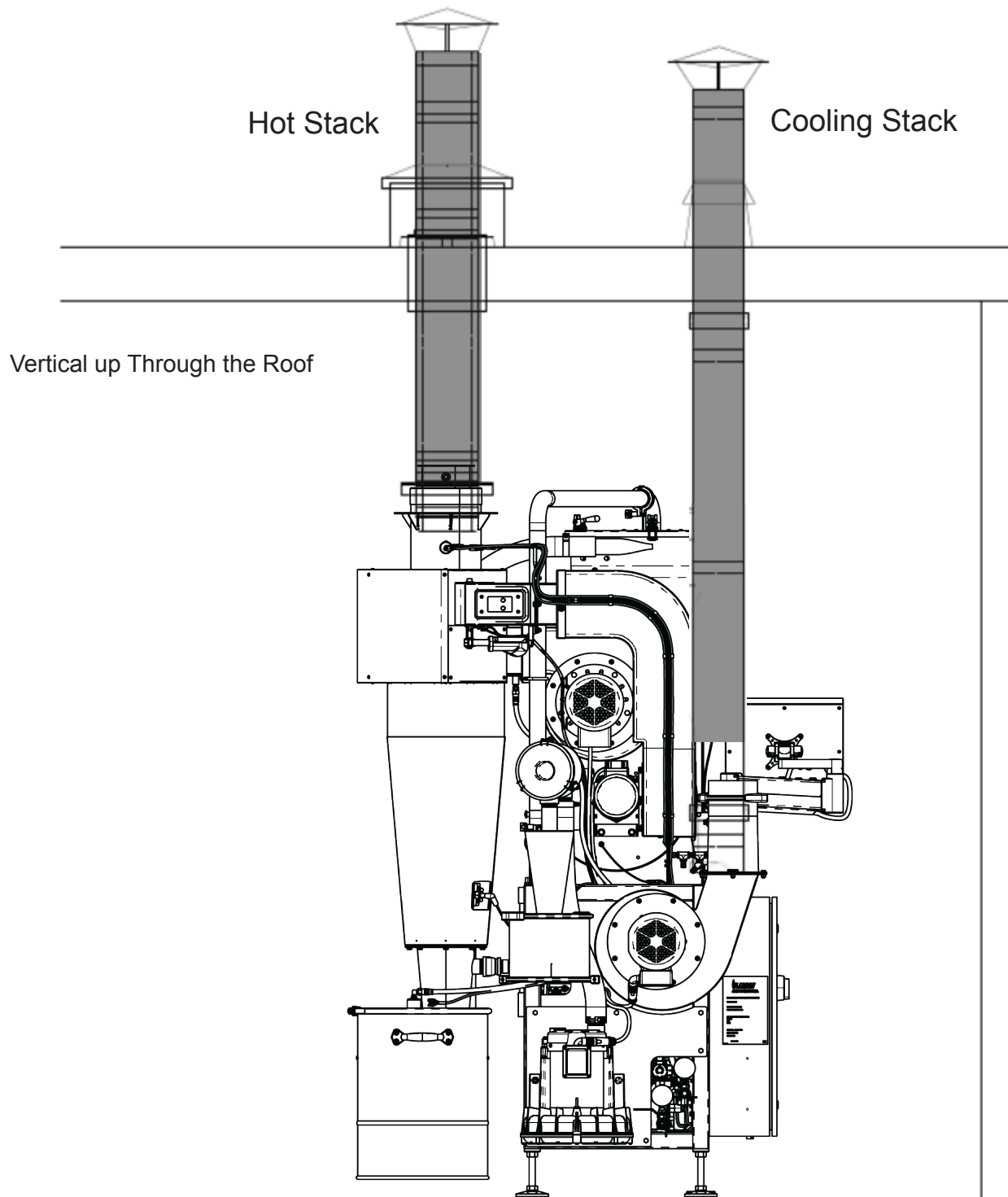
You will need to refer to your ventilation contractor for the preferred method of attachment. In turn, your ventilation contractor will need to be sure to comply with all applicable local and regional regulations regarding installations of this type.

Connection to be avoided

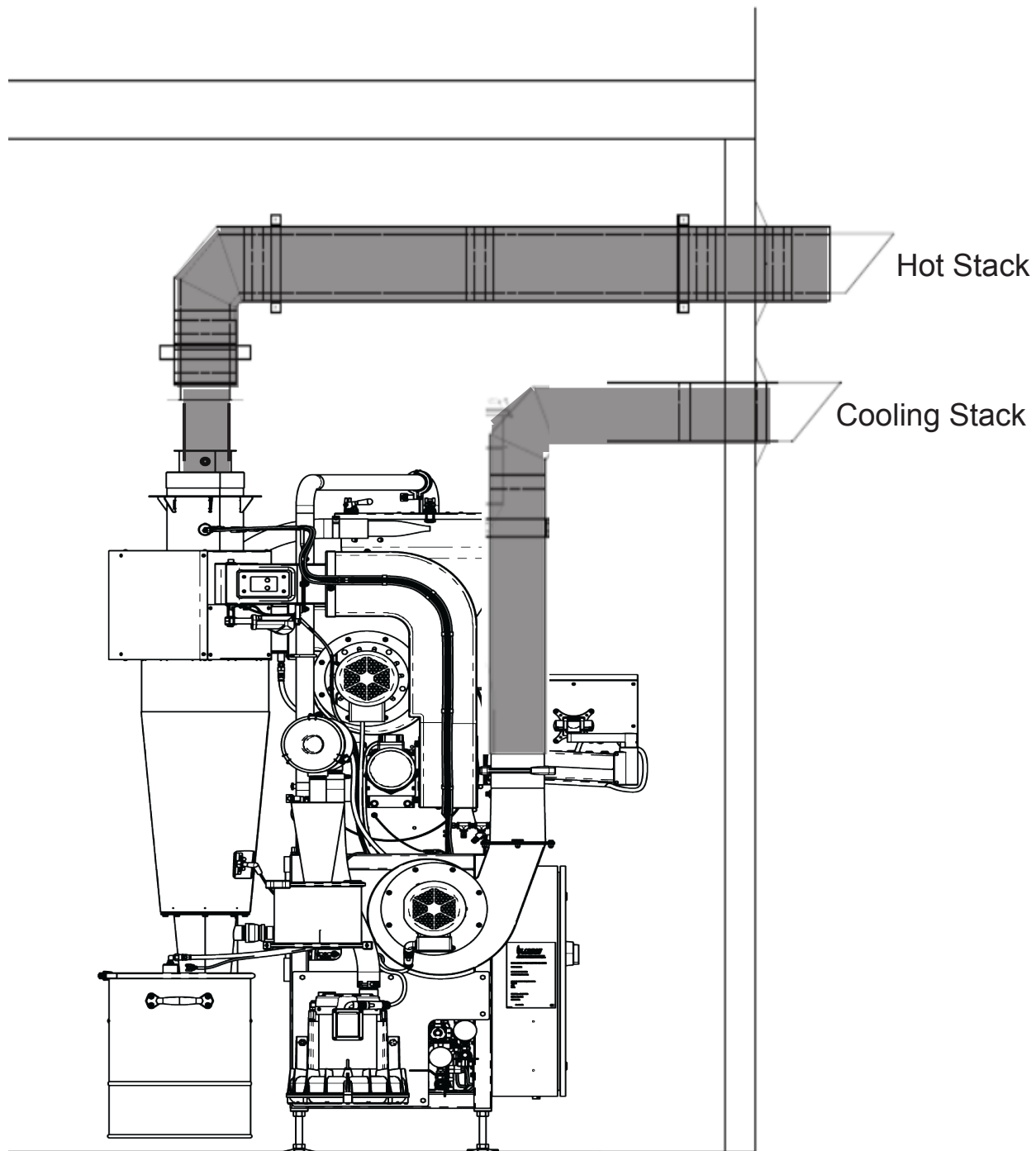


Vent Stack Configurations

Vertical up Through the Roof



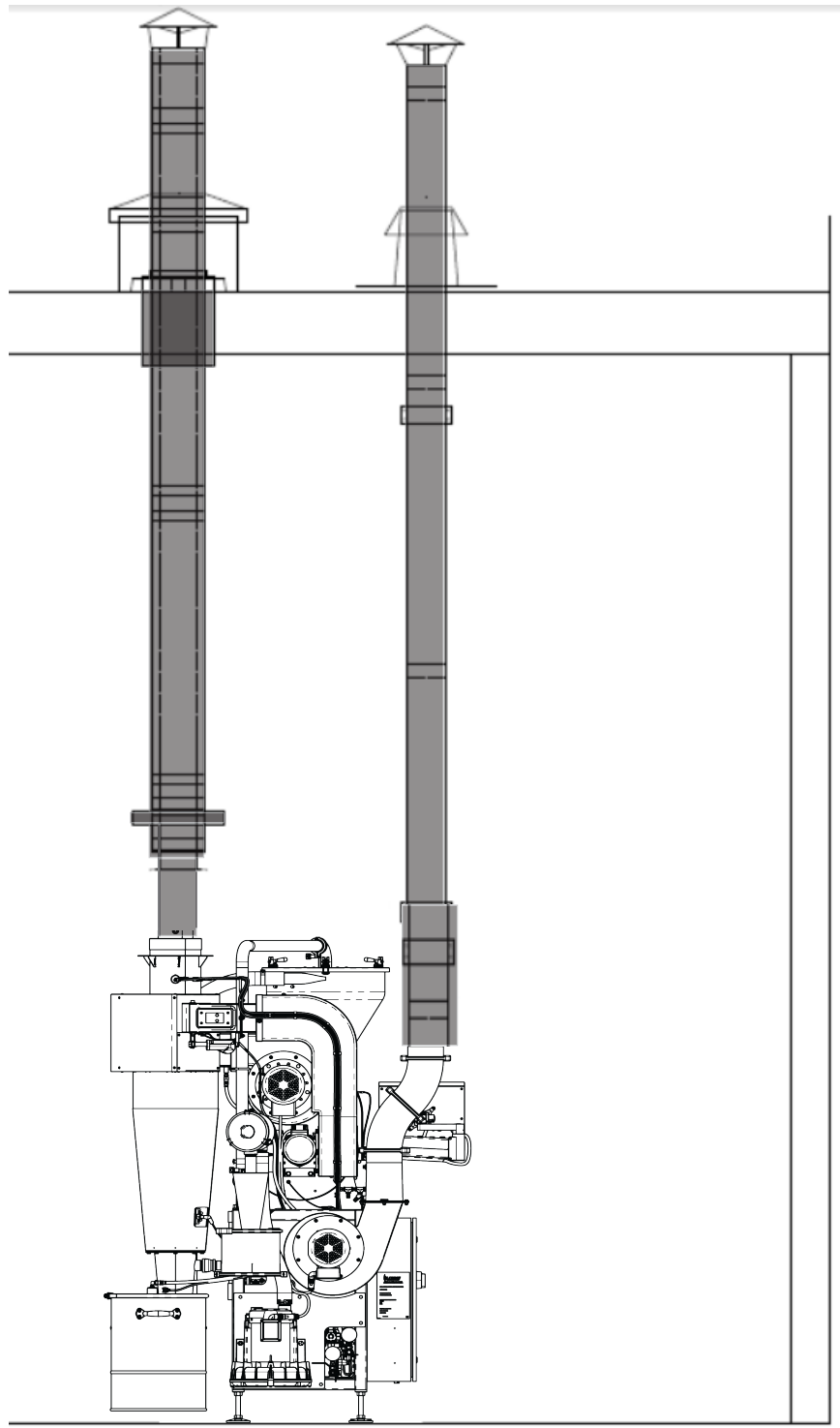
90 Degree Horizontal Through the Wall



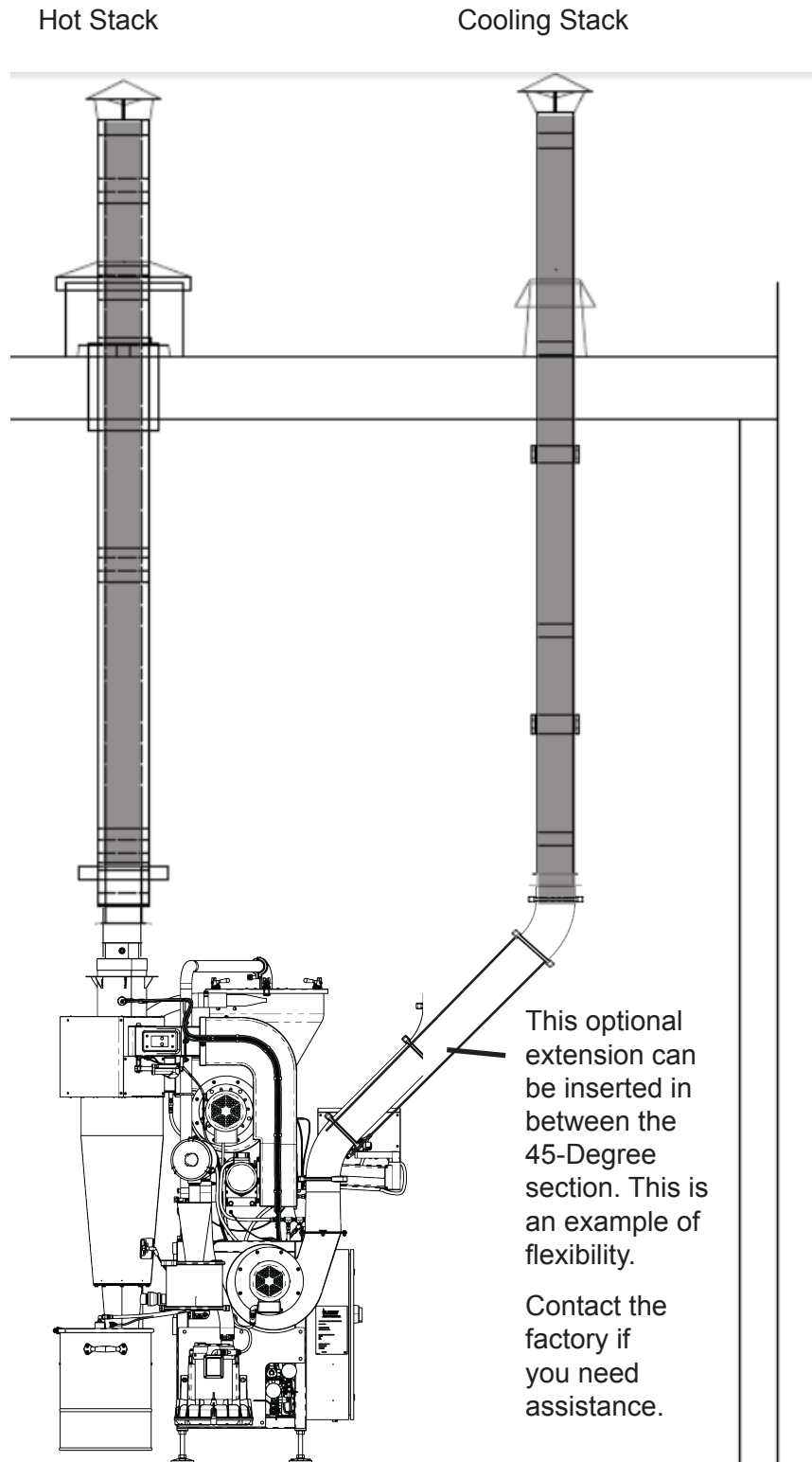
Vertical with 45 Degree Vent Kit

Hot Stack

Cooling Stack

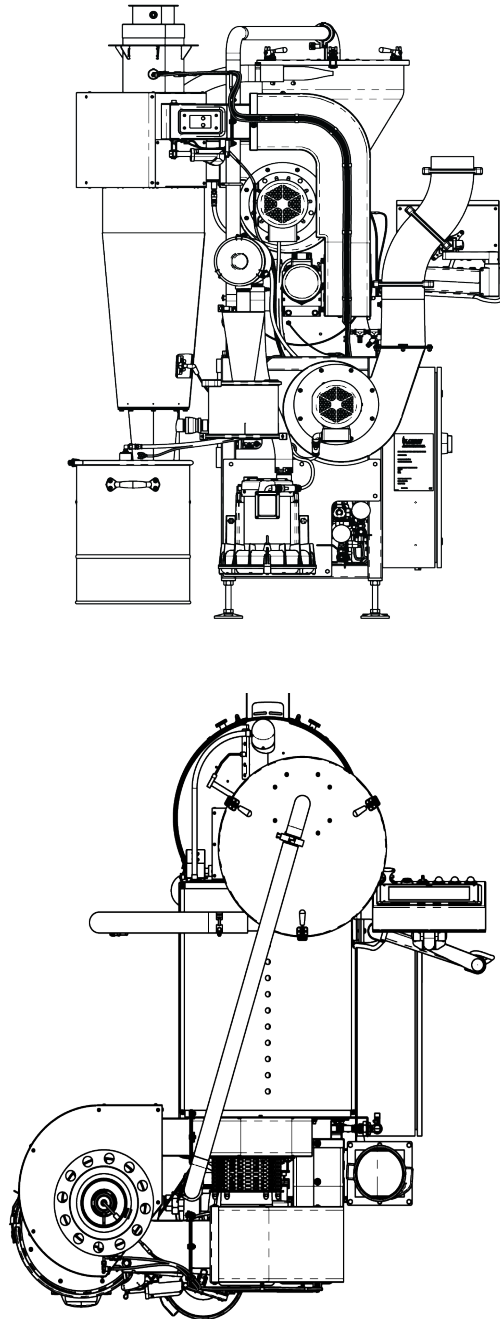


Extended 45 Degree Extension on Cooling Duct



Adjusting Roaster to the Vent Stack

Using a Standard 45 Degree on Cooling Duct





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Manufacturer Contact Information

This equipment is manufactured by:

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