

VENT-SURE INSTRUCTION MANUAL (EUROPEAN VERSION)

READ THE INSTRUCTIONS

You are now the proud owner of an L&L "VENT-SURE" kiln ventilation system, engineered to give you the utmost in performance and results. This is an expensive and potentially hazardous appliance (if not used with proper caution). PLEASE TAKE THE TIME TO READ THESE INSTRUCTIONS. There is important information that you need to understand to operate your L&L kiln ventilation system safely and properly.

CHECKING SHIPMENT

Your ventilation system was carefully packed and inspected prior to shipment to make sure that all accessories were in perfect condition.

When carrier makes delivery, you should immediately unpack your ventilation system and accessories to determine whether or not any damage has occurred.

If damage has occurred, retain all of the packaging material and notify the delivering carrier at once, requesting an inspection report. Retain all papers to insure that a proper claim can be filed.

INTRODUCTION

WHAT DOES THE VENT DO?

The Vent-Sure Kiln Ventilation System is designed to pull air contaminated with carbon monoxide and other fumes including those of volatile metals, decals, sulfur oxides, and others in a downdraft fashion out of the bottom or side-bottom of the kiln and then vent the fumes outside or to a central vent system.

MOUNTING OF THE VENT BLOWER

The vent blower is mounted on an outside wall or window, or near an existing exhaust ducting system. (With the special "Multi-Mounting Bracket" the vent motor may be mounted on the floor or a wall with the outlet pointing up and then connected to an existing vent system or 10.1cm wall outlet). The Bypass Collection Box mounts to the kiln either on the side of the bottom kiln section, or underneath the kiln on the kiln stand. (L&L kilns have studs on the stands to accept this box). It covers holes drilled through the brick. The blower is then connected to the Bypass Collection Box with the flexible aluminum duct, and the blower is plugged into a 240 Volt receptacle for operation.

NEGATIVE PRESSURE

When operating, the Vent-Sure system creates a negative pressure (partial vacuum) in both the Kiln and the flexible aluminum duct, so that fumes are pulled out of the kiln as well as out of the flexible duct. No taping of joints is necessary (although it is OK to do this). Should a leak develop in the duct, air will be sucked into the duct rather than blown out of it. This is a major advantage of the L&L Vent-Sure kiln vent system.

AIR INLETS

Normally no holes are necessary in the lid brick for fresh air inlet as the leaks in most kilns allow sufficient fresh air to be drawn into the kiln through element end penetrations, peephole plugs, leaks between the lid and the top section, leaks between sections, and leaks between the bottom section and the bottom brick. Holes may be drilled in the lid brick at any time if later found

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necessary. If you decide to drill holes in the lid start with a 6mm diameter hole drilled about 10cm in from an edge of the lid (and then add other holes as necessary in the back of the lid and then on the sides). **BE SURE NOT TO DRILL ANY HOLES WITHIN 15cm OF THE THERMOCOUPLES.** You do not want cold air flowing onto the thermocouples.

HEAT IS AWAY FROM MOTOR

Other important advantages of the L&L Vent-Sure downdraft kiln vent system are that the motor, being mounted away from the kiln (and the floor), will not pick up brick dust (which could destroy the motor), will not cause the kiln to vibrate (which can cause ware to move, damage to the kiln, and misfiring of cones on a Dawson Kiln Sitter) and will not be affected by the heat of the kiln. Because the motor is not under the kiln you can turn the vent off whenever you want. It is not necessary to keep it on to cool the motor as in some other kiln vents.

IMPORTANT CAUTION

DO NOT OPEN ONE OF YOUR PEEPHOLES WHEN USING A THE VENT-SURE VENT (regardless of what it may say in the Dawson Kiln Sitter manual). Opening a peephole is acceptable **ONLY** when venting your kiln manually by opening the lid. Also do not open the lid when venting with the Vent-Sure. It will let in far too much air when you are using a motorized vent. **THIS CAN BE DANGEROUS** because the cold air can cool down the thermocouples or Dawson tube assembly and trick the thermocouple or cone into thinking that the kiln is much cooler than it really is. **THIS COULD LEAD TO AN OVERFIRED KILN OR OVERFIRED WORK!**

WHAT IS INCLUDED

- One (1) wall-mounted blower mounted on a bracket with vent pipe to go through outside wall and a Motor Inlet Duct. A power cord with an attached On/Off switch plugs into a 240 volt standard receptacle.
- One (1) Bypass Collection Box to be mounted to the kiln or on the kiln stand, with mounting hardware.
- One (1) length of flexible aluminum ducting (expands to 4.5 meters (15 feet)).
- Two (2) hose clamps.
- One (1) 10.1cm diameter (4") 90 degree elbow (for outside the building).

FEATURES AND SPECIFICATIONS

ADJUSTABLE AMOUNT OF VENTING

A sliding adjuster on the vent Bypass Collection Box adjusts the amount of venting from the system. Vent only what you need to vent - don't waste heat and energy by venting more than you need.

EXTERNAL VENTING

External venting is safer and surer than venting to the inside of your kiln room with a filter.

REMOTE MOUNTING OF MOTOR

The vent blower motor is mounted to a wall plate with a 30cm length of exhaust pipe that mounts on the wall (see photo). This keeps the heat of the kiln away from the motor (for longer motor life) and keeps the motor vibration away from the kiln. (With the special "Multi-Mounting

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Bracket” the vent motor may be mounted on the floor or a wall with the outlet pointing up and then connected to an existing vent system or 10.1cm wall outlet. If you decide to mount it this way see the caution on page 6).

MOUNTS ON ANY KILN

The Vent-Sure vent system can be installed on almost any kiln. It requires only that you drill several small vent holes through the kiln side wall (or floor) and four mounting holes to mount the bypass collection box to the kiln wall. Mounting hardware is included. You can also order one of L&L’s heavy-duty aluminized stands to mount the vent on and support your kiln.

POWERFUL VENT MOTOR

The blower vents up to 130 CFM (cubic feet per minute). Remember - not all of this comes from the kiln - some comes from the Bypass Collection Box.

OUTLET TEMPERATURE UNDER 65 Deg C

The outlet temperature of the air is less than 65°C as long as you do not exceed the recommended holes in the kiln.

FLEXIBLE DUCT INCLUDED

4.5 Meters of flexible expandable aluminum 7.6cm diameter duct is included along with necessary hose clamps. Longer lengths or lengths of 7.6cm stove pipe can be used as well.

LOW ELECTRICITY USAGE

The Vent-Sure vent System uses only 1.37 amps.

VENTS UP TO 566 LITRES (20 CUBIC FEET) OR MORE

The Vent-Sure vent System was designed to be used with all L&L model kilns. We recommend one vent system for kilns up to approximately 566 litres (20 cubic feet).

INSTALLATION

IMPORTANT CAUTION

MAKE CERTAIN KILN POWER IS OFF BEFORE PROCEEDING WITH INSTALLATION.

Step 1. Turn Off Kiln Power

- This is critical for safety reasons.

Step 2. Install Bypass/Collection Box

- If mounting on a new L&L kiln stand, simply place the box on the studs on the bottom of the kiln stand and tighten with the provided nuts (and lock washers).
- If you are mounting the box on a section of the kiln, position the bypass/collection box in desired location, mark the four mounting hole locations with a marker, move the box and drill the 4 holes with a 1.5mm drill bit. Attach the box with four 1.5mm sheet metal screws, these are not included and must be purchased separately.
- Next you will drill the venting hole or holes through the floor or the kiln section. Note that this may already be done on kilns that come from the factory ordered with the Vent-Sure vent system. See the chart in these instructions for the number of holes. If you later

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decide that that you want more or less ventilation, you can add or plug the holes accordingly. Be conservative. It is easier to add holes than plug them up (although that can be done with a brick repair kit).

- Attach the box to the kiln section using the provided hardware.

Step 3. Install Blower System

- Install blower system by penetrating outside wall or setting into a window with appropriate support. Attach the provided 90 degree elbow to point down on the outside of the building (this is to prevent rain water from getting into the duct). (Note: this procedure will change if you use the Multi-Mount bracket). Mount securely because motor may vibrate over time especially if it builds up any dust in the blower.
- The motor assembly comes pre-mounted onto the Wall mount bracket:

A CAUTION ABOUT MOUNTING VERTICALLY

- If the discharge duct of the vent is mounted pointing up (as shown on the photograph of the Vent-Doubler system) water that condenses in the duct may drop down and rust the motor. We recommend having a water trap in the bottom of a vertical duct run to drain off the water before it runs into the motor. This is not a problem when the vent has been mounted horizontally. The Multi-Mount bracket will allow you to mount the motor horizontally as well. You can then use 90 degree bends or flexible duct to go vertically. Just remember that there is water in the exhaust that will condense somewhere as it cools after it discharges from the vent motor.
- A special Multi-Mount bracket is available which will allow you to mount the vent on the floor or wall with the outlet of the vent pointing up. This is useful when you want to use an existing penetration in a wall that won't support the vent (like a window) or when you want to have the vent go out of a roof or into a central vet system.

Step 4. Connect Flexible Duct

- Attach blower system to bypass/collection box by stretching the flexible aluminum duct carefully (it can extend up to 4.5 meters) and securing to both the blower housing and the bypass/collection box with the provided hose clamps. NOTE: You may want to firmly attach this to the Bypass Collection Box before installing the kiln on the stand because it can be hard to maneuver under the kiln.

Step 5. Plug In Vent

- Plug in the switched cord to a standard 220-240 volt receptacle. You can safely use a grounded extension cord because of the small amperage required. Be sure to secure cord away from hot case of the kiln.

ROOM AIR REPLACEMENT

ROOM AIR REPLACEMENT:

The Vent-Sure system moves up to 3,680 litres (130 cubic feet) of air per minute. We suggest opening a window slightly, or bringing other fresh air source into the room, to replace this room air.

INSTALLATION OF MULTIPLE VENTS

VENT DOUBLER SYSTEM

This shows a photograph of the Vent Doubler System available from L&L:



The Vent Doubler system includes a bracket for mounting the vent motor on the floor or wall (as shown), an extra Bypass Collection Box, an extra Flexible Aluminum Duct and a “T” Connector with dampers. You can vent two 290 liters kilns with one Vent-Sure plus this Vent Doubler System.

CENTRAL VENT SYSTEMS

Multiple Vent-Sure systems may be installed individually, or each system may be connected to a central duct. The following information is provided to help the installer make decisions concerning the size and length of the central duct.

CENTRAL DUCT SIZING

QTY OF SYSTEMS	SIZE OF CENTRAL DUCT
1	10.1cm (4")
2	15.2cm (6")
3	20.3cm (8")
4	20.3cm (8")
5	25.4cm (10")
6	25.4cm (10")

EXTENDING DUCT LENGTH

The duct may be 18.25 meters in length, and include up to four 90 degree bends, without a significant drop in static air flow or a reduction in kiln air pull. You may use any galvanized,

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stainless or aluminum duct. The outlet duct size (after the motor) is 10.1cm diameter. The inlet duct (before the motor) is 7.6cm diameter.

TYPICAL NUMBER AND SIZE OF HOLES TO BE DRILLED IN L&L KILNS

MODEL	LITERS	NO OF HOLE	DIAMETER
e18S	70	1	6mm
e18T	105	1	6mm
e23S	125	2	6mm
e23T	190	2	6mm
e28S	190	2	6mm
e28T	290	3	6mm

OPERATION

Plug blower cord into 120 Volt receptacle. Close all kiln apertures such as peepholes, etc. (See important caution regarding this on page 3). Close the lid and fire. For heavy loads with lots of fumes you may want to avoid firing faster than 66°C per hour to prevent the generation of more fumes than the system can eliminate. Use the flow control on the Bypass Box to modify the flow of exhaust - a larger flow control opening reduces the flow of exhaust fumes from the kiln, and a smaller flow control opening increase the exhaust.

IMPORTANT CAUTIONS

- CAUTION: Check duct occasionally to see if there is wax or other residual build up. Wax could condense in the duct, which is a potential fire hazard. This is especially important if you are using a wax resist.
- CAUTION: Be sure that the exhaust of the vent is not being brought back into your building. Keep exit of vent at least four feet away from any open windows or doors.
- CAUTION: We recommend the use of a carbon monoxide monitor in your kiln room. These are available from good hardware stores, Graingers or Home Depot for about \$50 (This is another good way to be sure you are getting proper venting).
- CAUTION: Disconnect power cord from power source when doing any maintenance on the fan motor. Do not put your fingers inside the blower without disconnecting power. Blower may start unexpectedly because of automatic thermal shut off switch built into the motor.

ADJUSTING THE BYPASS SYSTEM

The sliding adjuster allows you to fine adjust the amount of venting that is done to your kiln. It is easy to adjust but hard to know just how to adjust it. The problem is that there are many factors that contribute to the amount of “pull” required. For instance, the amount of fumes that are being given off by your specific work is one factor. Some clays have a lot of carbon in them; others do not. Depending on the size of the load, and the ingredients in the clay/glaze, there will be more or less fumes generated. Another factor is the “static pressure” in your vent ducts. If you have a lot of curves, 90 degree bends, or long runs of duct this will increase the static pressure (back

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pressure) and hence increase the need for more venting force. One suggestion is to start with the valve in the half open position and see what happens.

The Smell Method:

To some extent you can go by fumes that you smell. However, carbon monoxide is odorless. You should get a carbon monoxide warning alarm for your kiln room in any case so if this goes off you will know you need more venting. Also, if the kiln is in a damp spot, the bricks can absorb moisture, and grow some mold. The mold will burn off, and you would smell it burning. As soon as the kiln goes on, you may well smell stuff that can't be taken away by the vent, and you won't be able to prove it's not a faulty vent. Smell is therefore not a foolproof method to verify the success of a vent.

Industrial Point of View:

A typical rule of thumb for purging panels of hazardous fumes (in explosive environments) is four volume changes of air per hour. This seems intuitively the same for fumes in a kiln. However, there is no easy way to measure these volume changes and we mention this fact as a point of reference only.

The Smoke Method:

- 1) With power disconnected from the kiln and with the kiln empty, turn the vent on.
- 2) Start with the bypass valve in the fully closed position. This will give it the maximum suction in the kiln.
- 3) Light a piece of paper on fire or something that will create smoke. Blow it out, and hold it near the cracks around the closed lid.
- 4) If the smoke is being pulled into the kiln around these door cracks, open the Bypass (decreasing flow from the kiln) until the smoke stops being pulled in, then back up the valve slightly, so the draw increases just slightly again. Try this when kiln is at about 38°C.
- 5) You can do the same test directly at the bottom hole with the kiln open also to test the differential between the pull at the actual suction hole from the kiln and the pull around the lid.

For Gross Adjustment:

Remember that the sliding adjuster is for fine adjustment. Drilling or plugging the holes in the floor (and possibly adding or plugging holes in the top) is how you would dramatically change the amount of air vented.

VENTING CODES

- The following information is provided courtesy of The Edward Orton Jr. Ceramic Foundation.
- OSHA (the United States worker's health authority) has set standards for carbon monoxide exposure of 35 ppm (parts per million) for long-term exposure and 200 PPM for short-term exposure. Independent testing has shown that fumes near the kiln can exceed 200 PPM near the kiln during the firing of greenware. This can cause headaches, fatigue, sore throats and nausea. When properly installed and operated, a downdraft vent removes all harmful fumes and provides a safer working environment.
- Most states and localities have set venting requirements for firing kilns in public places. Your local and state health board should have this information. The Uniform Mechanical Code says that you must vent ceramic kilns. It says that you can use a canopy-type hood

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(and gives specific requirements for such use) or that "listed exhaust blowers may be used when marked as being suitable for the kiln and installed in accordance with manufacturer's instructions." Our Vent-Sure vent is UL listed and is appropriate to meet this ventilation requirement. L&L takes no responsibility for improperly installed vents or kilns nor do we take responsibility for the use of other vents with our kilns.

REGULAR MAINTENANCE

- Occasionally check for leaks in the aluminum duct. Replace if necessary. Check for corrosion especially if you are using clay with a high content of sulfur, phosphorus or fluorine. Check for wax or carbon build up if you are using a wax resist process or a high carbon content clay.
- We recommend unmounting the fan and blowing out the squirrel cage with compressed air every two years or so especially if you are in a very dusty or if you have it mounted on the floor where it is more likely to pick up dust.
- If the discharge duct of the vent is mounted pointing up you may get water that condenses in the duct drop down and rust out the motor. Taking it apart and spraying with WD-40 can restore the motor in some cases. We recommend having a water trap in the bottom of a long vertical duct run to drain off the water before it runs into the motor. This is not a problem when the vent has been mounted horizontally.
- The motor should be lubricated every 6 months with 10 to 20 drops of SAE 10W or 20W non-detergent oil (ML-type) or electric motor oil. Do not use car oil.
- There are two holes to put oil into on the motor:

FREQUENTLY ASKED QUESTIONS

The following Frequently Asked Questions are provided courtesy of The Edward Orton Jr. Ceramic Foundation. We add our own comments in parenthesis below.

How do I determine the size, number and location of holes in the top and bottom of the kiln?

As a general rule, you should have one 6mm hole for every 113 litres of kiln volume. The holes are normally placed within a 10.1cm circle in the center of the kiln floor. The same number of holes is used in the top of the kiln, but they are placed about 2.54cm in from the inner edge of the kiln wall. (L&L NOTE: L&L does not normally recommend drilling holes in the top like Orton does. Also see our hole chart on page 7 which is specific to our kilns).

How do I know if the system is working?

The easiest way to test the operation of the vent system is to turn the unit on and to place a lighted match directly over and level with one of the holes in the lid of the kiln. The flame from the match should be gently pulled into the kiln as a result of the draft. (L&L NOTE: See our comments under "Adjusting the Bypass Valve").

How hot does the duct get during the firing?

Due to the introduction of fresh air through the plenum of the vent system mixing with the hot gases being drawn from the kiln, the temperature of the duct of the duct is below 66°C. This will prevent burns from occurring in the event of the duct being touched. (This is also true for the

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Vent-Sure - even more so because we are pulling a higher volume of air through the Bypass Valve).

How long can the duct be and how many bends can it have?

Up to 18 meters of ducting containing four 90 degree bends may be safely used with no drop in static air flow at the duct exhaust point or a reduction in draw at the kiln. The ducting can be run either horizontally or vertically. (The Vent-Sure should handle more static pressure than the Orton vent because of the stronger motor. This translates into longer lengths of pipe and more 90 degree bends. If you have a choice run two 45 degree bends rather than one 90 degree bend or use flexible duct which has a gentler bend).

Do I need double wall duct when going through the roof?

You do not normally need double wall ducting when going through the roof since the pipe or duct does not reach high temperature. It is always advisable to check your local building codes for their requirements.

What type of duct do I use if I need more than 2.4 meters?

You can use more of the flexible aluminum dryer ducting or you can use galvanized furnace ducting. We have also had people using "pvc" plastic piping with good results. (L&L NOTE: L&L does not recommend PVC pipe. We recommend using 4" diameter galvanized duct).

Will the fumes coming through the vent damage my plants, the neighborhood pets or disturb the local environment?

No. The fumes and the gases coming from the kiln have been diluted with enough fresh air to make them safe for the environment. (L&L NOTE: Do not, however, place the outlet of the vent below an open window. Also we have heard of plants near the vent outlet being affected by the vent fumes so keep this in mind when locating vent outlet).

Will using the vent cause my firing to take longer?

The vent system pulls only a very small amount of air out of the kiln, so very little heat is removed and firing times will change very little. For some kilns, a high firing may take a little longer. The insulation value and the number of air leaks in the kiln also determine the length of the firing. (L&L NOTE: We have seen vents overpower smaller kilns - so it is important to adjust the amount of venting in some cases. On the other hand an example of an e23T 190 litre kiln firing a 38.6 kg load on Fast Glaze program to cone 8 took 7 hours and 4 minutes with a vent on and 6 hours and 24 minutes without a vent. The vent was on the whole time).

What does it cost to operate the vent system?

The vent system typically costs less than 1 cent/hour to operate (electricity costs). Vent systems save on heating and cooling costs when compared to hoods. Hoods remove massive amounts of air from the kiln room - air that may have been heated or cooled, depending on the time of year. Downdraft type vents remove 80% less air in the kiln room than does a hood. (It does cost more to run the vent because it does take heat out of the kiln. For example an e23T 190 litre kiln firing a 38.6 kg load on Fast Glaze program to cone 8 took 70 KW hours with a vent on and 62 KW hours without a vent. At 8 cents per KW hour that would be a cost of \$0.64. The vent was on the whole time).

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Will the cold air entering the kiln damage the product?

The amount of air that is entering the kiln is so small that it does not cause problems with the ware. The top holes are placed toward the outside of the chamber area so that no air comes down directly onto ware that is placed near the top of the kiln. (L&L NOTE: This is fine but we do not normally recommend holes in the lid).

Will faster cooling crack the ware if I leave the vent on during the cooling Cycle?

No. Some kilns can cool an average of 4-1/2 hours faster with the use of the vent system. The cooling is faster but it is taking place at an even rate throughout the kiln avoiding uneven stresses being placed on the ware. Most ceramic ware can be cooled more quickly if the cooling takes place at an even rate. The rate of cooling increase will depend on the kiln size and the density of the load. (L&L NOTE: The vent will remove more molecules of air and hence heat as the kiln cools. This is because the density of the air increases the lower in temperature you go. This is one reason why kiln vents are so efficient - they don't remove too much heat when you don't want them too at the higher temperatures).

What should I do if I still smell fumes?

You should check your ductwork to make sure it is properly connected and that the joints are sealed. You can also check for extra air leaks around your kiln and repair these if necessary. (L&L NOTE: See our comments on "Adjusting the Bypass System").