

ENVIROVENT®

US PATENT NO. 4,863,374 and 4,978,295

INSTALLATION AND INSTRUCTION MANUAL

Read these instructions before you attempt
to install or operate the EnviroVent®

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I INTRODUCTION

The instruction manual

This manual covers the installation of the EnviroVent® on 8, 10, or 12 sided kilns with a firing volume of 12 cubic feet or less. This vent *is not recommended* for kilns smaller than 8 sides.

The EnviroVent®

The EnviroVent® is designed to provide sufficient air to your kiln for the proper firing of greenware, stoneware, porcelain, colored glazes, decals, Overglaze colors, lusters or metallics. It is also designed to collect the hot, smelly fumes produced during firing so they can be mixed with cooler room air before they are directly ducted outdoors.

Repeated testing demonstrates that you may enjoy some or all of the following benefits with proper installation and operation:

- a. most kilns will show a more uniform firing from top to bottom
- b. the kiln room environment will be more comfortable with little or no odors or fumes coming from the kiln
- c. colors will fire more consistently--particularly reds, oranges and yellows
- d. chances of being accidentally burned or of the kiln being jarred are reduced because the kiln lid stays closed during firing
- e. with proper ventilation, metal kiln components will last longer.

As with any change in firing routine, we recommend that you closely follow all instructions and monitor your firings with witness cone groups on each shelf in your kiln both before and after you install the EnviroVent®. If you have any questions, please contact your supplier.

Unpacking

The EnviroVent® kit includes the plenum/blower assembly, one 18" extension pipe connected by a transition tube to the plenum, two drill bits and two drill guides for modifying your kiln. In addition, a tag is included to attach to the kiln reminding the kiln operator to always turn the EnviroVent® motor on before firing.

Tools needed for installation

Screw driver; electric drill (if kiln has a steel plate on the bottom); vacuum cleaner; duct tape (optional); dryer vent kit with flapper lightweight enough to blow open easily.

Test Firing

Prior to installing the EnviroVent®, make at least one test firing with a series of witness cones on each shelf in the kiln. After installation, make another firing using witness cones and compare the results. We think you will be pleased with the evenness of heating you experience when using the EnviroVent®.

II INSTALLATION

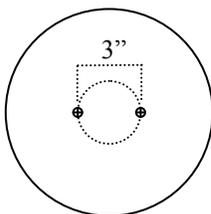
Preparing for Installation

Unplug your kiln before beginning installation. Place the kiln floor and lid on a clean, smooth surface.

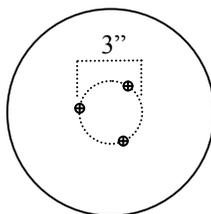
Before drilling, identify the chamber size of your kiln from the chart below to determine the correct number and pattern to drill. If you have a blank ring or a wired ring that you do not use for all of your firing, drill the number of holes for the *maximum* height of the kiln and plug the additional holes with a non-combustible material when the extensions are not being used.

Chamber Depth	Drill this many <i>large</i> holes (use 15/64" drill)	and	Drill this many <i>small</i> holes (use #21 drill)
eight sided kilns			
18"			2
20"			2
22 1/2"			3
27"			3
29"			3
31 1/2"			4
ten sided kilns			
18"			4
20"			4
22 1/2"			5
27"			5
29"	3		0
31 1/2"	3		0
twelve sided kilns			
27"	4		0
31 1/2"	5		0

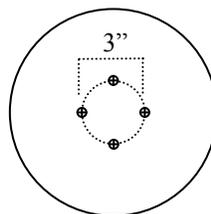
Placement of holes in kiln floor Diagram #1



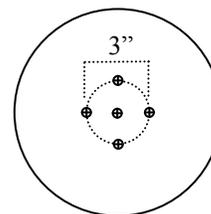
2 holes



3 holes



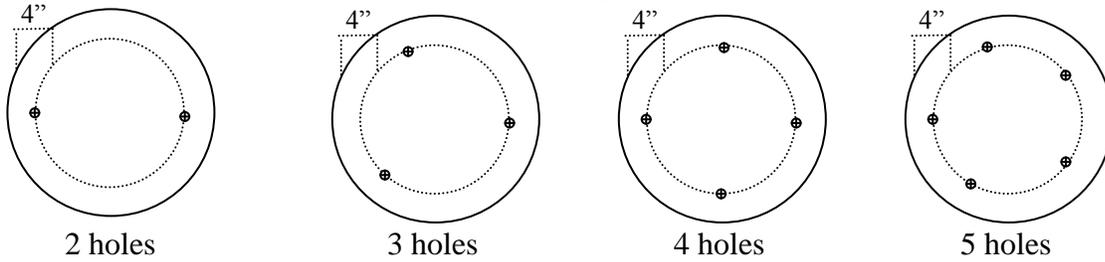
4 holes



5 holes

Placement of holes in kiln lid

Diagram #2



Drilling holes in the kiln floor

Locate and mark the center of the kiln floor. Use the pattern provided in the back of the manual as a reference for hole placement. **Important:** the holes in the floor must fit within a 4 1/2" diameter at the center of the floor to align with the hole in the plenum chamber of the EnviroVent® located directly below.

Do not drill holes with the kiln installed above the EnviroVent® or dust may damage its motor.

Use the drill guide provided to keep your drilling perpendicular. Use an electric drill if your kiln floor has a metal plate. With standard firebrick kiln floors, you have two options; use the drill guide and rotate the drill bit by hand, OR, firmly support the floor on a piece of scrap wood and use the guide and an electric drill to slowly drill through the floor into the wood. Precision and care are important to avoid an oversize hole or chipping of the floor underside.

Drilling holes in the kiln lid

Locate and mark the center of the kiln lid. Measure the thickness of the kiln fire brick and add 1" (will be approximately 3 1/2 to 4 inches). Space the holes evenly around the kiln lid but no closer to the edge than the distance above. Because the holes introduce room temperature air into your kiln, they must not be clustered. Refer to diagram #2 for help. Use the same drill guide to keep your drilling perpendicular. Rotate the drill bit by hand, OR, firmly support the lid on a piece of scrap wood and use the guide and an electric drill to slowly drill through the lid into the wood. When finished, you should have the same number and size holes in your lid as your floor, although their arrangement is quite different.

Figure 1

Drilling by hand

Careful, supported drilling

Vacuum out any brick dust from inside your kiln caused during the drilling.

Replacing the kiln on the stand

Place the EnviroVent® unit on your kiln stand as shown in the photo. The kiln stand must be 8” high. Tilt the stand at an angle to avoid forcing the vent tube through the opening. There must be air space between the motor and floor.

If your kiln stand *is not* 8” high, obtain a new one or use non-combustible supports to elevate the stand. The use of shim blocks is acceptable provided the kiln remains stable and level.

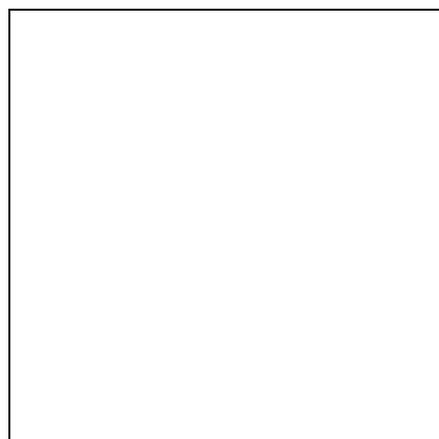


Figure 2

Type and Length of ducting

A flexible 4” aluminum dryer ducting is recommended for installation. No more than four 90° bends may be used without reducing air flow in the venting system or reducing draw into the kiln. Distances *beyond* 60 feet or installations with more than four 90° bends need a transition to 6” ducting no farther than 20 feet from the plenum. It is possible to transition directly from the plenum.

Selecting and Installing the Ducting

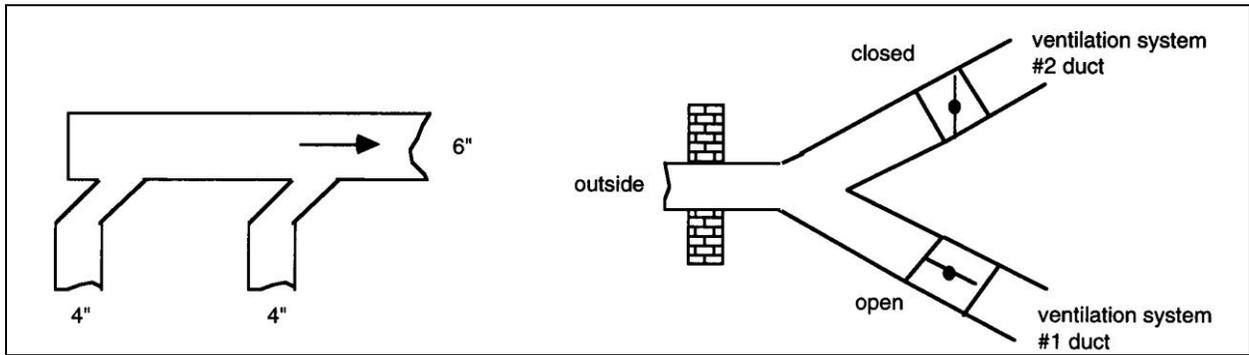
If you have more than one EnviroVent®, you may install them individually or connect each unit to a central duct to remove the gases. If a central duct is used, hook the individual vent ducts to that central line.

To determine what size of central ducting to install, use the chart below. A “Y” adapter can connect two kiln ventilation systems together. However, a damper should be installed in each duct line and left closed when the ventilation system is not in use. This prevents a “back flow” of fumes into the unused ducts.

Central Duct Sizing

Number of EnviroVents®	Recommended Size Central Ducting
1	4”
2	6”
3	8”
4	8”
5	10”
6	10”

Discharge may be horizontal or vertical with the exit located a minimum of four feet from any opening (window or door) into the building. Provide a shield to prevent rain or snow or small animals from entering the ducting exit. For horizontal discharge, a flapper or hood type dryer exhaust vent may be used. For vertical discharge, a cap type shield that does not reduce the discharge may be used.



Finishing Installation

Attach the reminder tag to your kiln on the switch box where it will always be seen before firing. Plug the EnviroVent® into a standard 115V outlet. **Important:** Always fire with the EnviroVent® motor in the ON position. If you have reason to fire with the EnviroVent® OFF, plug the holes in the kiln floor to prevent damage to the motor that would void the warranty.

Testing the EnviroVent®

Test your new vent system by closing the lid and all the peepholes. Place a lighted match directly over and level with one of the lid holes. Turn on the EnviroVent. The flame from the match should be pulled into the kiln as a result of the draft. If you are unsure of the effect of the draft, observe the action of the flame away from the hole and then move it over the hole. If the flame is not pulled into the kiln, the kiln is not venting properly. See the Section 5 on Troubleshooting. Repeat this test regularly to ensure continuing accurate operation.

III FIRING

Shelves

The bottom kiln shelf, either a full shelf or two half shelves placed with a slight gap between shelves, need to be supported at least one inch off the kiln floor to allow sufficient air circulation. If the holes are blocked, venting cannot take place. Subsequent shelves through the kiln may be placed with a slight gap between them to allow the best air circulation.

Important: Keep the kiln floor clean and the holes unobstructed for the EnviroVent® to continue doing its job properly.

Motor Operation

The EnviroVent® motor must be switched ON throughout heating in order to ventilate your kiln and collect the fumes. The motor has a fan that keeps it cool and operating properly during the hottest firings. If you fire with the motor off beyond 2000°F, you void the warranty and may damage the motor.

Leaving the motor in the on position during cooling will reduce the amount of time it takes to reach a temperature where you can safely handle your ware. If a slower cooling is preferred, the EnviroVent® may safely be turned off when the internal kiln temperature is less than 2000°F.

Fresh Make-up Air

It is essential to have a source of fresh air to replace the air vented outdoors. The EnviroVent® fan moves between 60-80 cubic feet per minute. Unless you know that the room ventilation can handle the total volume of loss, leave a window or door slightly ajar for make-up air. **Remember:** do not exhaust fumes near a fresh air intake.

Loading

Loading the kiln evenly from top to bottom is still recommended, but not as critical as before venting. Certain applications may require placing a shelf between the lid and top ware for air deflection below the air holes or a small plate under each hole.

Plug all Peepholes and Shut Lid

Turn on the EnviroVent® motor, close the lid, plug the peep holes and fire. You can open any peephole during firing to check the bending of witness cones and the progress of your firing. Do not prop the lid or leave any peepholes open during a normal firing. To do so can cause fumes to enter the room and additional room temperature air drawn into the kiln may affect the firing.

Firing times

When the correct holes are drilled in your kiln, firing times should not be much longer than normal. If firing times are significantly longer, see Section 5 on Troubleshooting for help.

Additional ventilation

Additional ventilation may be necessary when firing with wax resist; using high sulphur or organic content clay bodies and glazes, thick-walled (over 1/4" thick) bisque pieces; firing outside the United States where 50 cycle electricity is supplied; or when additional volume is added to the kiln with a blank or wired ring.

If it is necessary to increase ventilation, drill additional hole(s) in the kiln floor only. For an eight-sided kiln, drill one additional small (#21) hole. For a ten-sided kiln, drill two additional small (#21) holes. For a twelve-sided kiln, drill one additional large (15/64") hole. Do not drill more than 6 large holes in the bottom of a kiln.

Insufficient ventilation can cause black or gray interiors in bisque, reduce element life, and permanently alter some colors. However, too much ventilation may decrease the heating uniformity of the kiln, so reducing the load may be the best solution.

Fume Removal

The EnviroVent® pulls air into the kiln near or at the top, then draws air out of the kiln near or at the bottom during firing. This method causes the air pressure in the kiln to be slightly lower than outside of the kiln. As a result of this negative pressure, air will be pulled into the kiln through any hole or crack. This will remove essentially 100% of the fumes generated, providing:

1. the system is installed properly for controlled air flow
2. the kiln is not excessively loaded with ware
3. heating rates are *less than* 150°C/hour or 300° F/hour for heavy loads
4. the kiln does not contain gaps, holes or large cracks

The 4" exhaust venting from the kiln to the outside is positive pressure. Take care to ensure all joints are sealed (duct tape or high temperature silicone sealant work well) to prevent fumes from entering the room.

IV MAINTENANCE

The EnviroVent® requires periodic housekeeping to maintain it in good condition and insure proper operation. This is very important. Failure to provide proper maintenance could void your warranty and damage the EnviroVent® or your kiln.

Important: The kiln floor must be clean and the holes unobstructed to continue proper operation.

Monthly

- a. Unplug the EnviroVent® and your kiln. Vacuum around the blower motor to remove accumulated dust and debris.
- b. Clean the motor surface nearest the floor.
- c. Remove any obstacles that impede the air flow around the motor.

Annually

- a. Unplug the EnviroVent® and your kiln. Remove the kiln shelves and vacuum the kiln floor.
- b. Remove the kiln from above the EnviroVent®. Remove the motor from the plate. Examine inside the plenum chamber and motor surface for debris.
- c. Thoroughly vacuum the motor and plenum or use an air compressor to blow out dust and debris. Take motor mount off plenum. Replace and recaulk.
- d. Replace the sealant and caulk around the motor.
- e. Recaulk any air leaks from the blower out to the exhaust point.

V TROUBLESHOOTING

Problem	Cause	Solution
1. Smell or odor coming from kiln	EnviroVent® leaking between blower and outside ducting	seal all leaks around duct connections or seams and blower box with silicone sealant or duct tape
	too many holes and leaks in upper part of kiln	plug or repair all cracks in kiln and plug smallest lid hole-test fire
	fumes discharged outdoors are coming back into room	locate make-up air source further from discharge exit or raise or extend exit vent or open ventilation port cover wider
	kiln not venting	see Section 2
2 Kiln not venting	shelf placed directly on kiln floor without posts	support first shelf with posts at least 1” tall to permit circulation
	lid holes drilled above kiln walls	drill correct holes above firing chamber
	floor holes not within 4 1/2” plenum opening	drill correct holes above plenum entrance, plug incorrect holes
	kiln moved so floor holes blocked below by plenum assembly	move kiln floor or assembly so holes are aligned
	exit ducting blocked, kinked or pinched	open, straighten or repair exit ducting
	flapper on dryer vent not opening	replace flapper with easier operating one
	exit ducting has too many bends or is too long	reduce the number of bends and the duct length-avoid 90° bends
3 Kiln slow to reach temperature	too many holes or air leaks	plug or repair cracks in the kiln, plug smallest hole, lid and floor, test fire
	heating elements have aged or other factors are affecting kiln not related to EnviroVent®	check heating elements and if necessary have kiln repair person check kiln

4 “Cold” spot near top of kiln	lid holes too close together	plug lid holes and redrill at proper spacing - see diagram
	shelf too close to top of kiln	lower shelf
5 Blower motor does not run	switch is turned off	turn in-line switch on
	not plugged in	plug into 115v outlet
	circuit breaker tripped or fuse blown	check room electrical panel
	motor or wiring burnt out	replace motor
6 Bisque fires with black or gray interior	insufficient venting	increase ventilation or reduce size of load
7 Black particles of carbon when firing wax resist	insufficient venting	reduce amount of wax resist or increase ventilation
8 Heating elements pitted or metal appears discolored	insufficient venting	reduce organic or sulphur content in bodies or increase ventilation
9 Vibration of kiln	kiln stand is not level	level kiln stand
	blower mounting loose	tighten mounting firmly
	motor bearings damaged	replace motor
	impeller blades off balance due to accumulated debris	use a compressor to blow out debris

If you determine a hole needs to be closed, obtain some firebrick patching material or ceramic fiber from your local ceramic distributor. A paste made of high temperature kiln wash is also acceptable for patching. When making the repair, force the material into the hole from both sides of the hole. Allow to dry before firing.

VI SERVICE

When service is required

If your EnviroVent® requires service, contact your dealer, distributor or Skutt Ceramic Products, Inc.

VII REFERENCE

The EnviroVent® is a UL listed accessory when used with the following Skutt UL listed kilns.

Models	1227-3	240 or 208 volt	
	1227-3	240 or 208 volt	3 phase
	1027-3	240 or 208 volt	
	1027-3	240 or 208 volt	3 phase
	1027	240 or 208 volt	
	1027	240 or 208 volt	3 phase
	1018-3	240 or 208 volt	
	1018	240 or 208 volt	
	818-3	240 or 208 volt	
	818	240 or 208 volt	
	818P-3	240 or 208 volt	
	818P	240 or 208 volt	
	KM818-30A-3	240 or 208 volt	

NOTE: All of the above kilns *may* have a prefix of KM or KS.

VIII SPECIFICATIONS

Motor: 115 volt
1.1 amps
0.18 horsepower

Heat exiting blower: 160° F maximum

Static pressure: 0.2 inches
distances greater than 60 ft: 0.4 inches

Blower: 60-80 cfm
distances greater than 60 ft: 60 cfm

Maximum kiln capacity for use with EnviroVent®: 14 cubic feet

Plate: 23" across

IX
SKUTT CERAMIC PRODUCTS WARRANTY-
LIMITED

SKUTT CERAMIC PRODUCTS, INC. warrants this product to be free from defects in materials and workmanship for two full years from the date of the first retail purchase from an authorized Skutt dealer.

What Skutt Will Do. Skutt will repair or replace, at its expense, any defective part upon return, freight prepaid, to any authorized Skutt service center.

What Is Not Covered. This Warranty does not cover (1) any defect not reported to an authorized Skutt dealer or distributor within 10 days of discovery; (2) the KILN SITTER®, which is separately warranted by its manufacturer, W.P. Dawson, Inc., 399 Thor Place, Brea, California 92621; (3) Type K Thermocouples; (4) any damage caused by overfiring; (5) products subjected to abnormal strain, freight damage, neglect, abuse, improper storage, failure to follow instructions, or products altered from factory standard condition; (6) products whose identification number has been changed; (7) failures of, or failures caused by, parts or accessories not manufactured or supplied by Skutt Ceramic Products; (8) kilns used for purposes other than firing ceramic materials; and (9) kilns used for reduction or salt firing.

How to Obtain Warranty Service. Notify your Skutt dealer or distributor within 10 days of discovery of any defect. Deliver any defective part, freight prepaid, to an authorized Skutt service center. A list of Skutt service centers may be obtained from your dealer or from Skutt Ceramic Products, Inc. at the address and telephone number below.

Other limitations. ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING PROPERTY DAMAGE, LOST PROFITS, LOSS OF USE, OR OTHER ECONOMIC LOSS, ARE EXCLUDED TO THE FULL EXTENT PERMITTED BY STATE LAW. Some states do not allow the exclusion of incidental or consequential damages, so the above exclusion may not apply to you. ANY IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE DURATION OF THIS LIMITED WARRANTY. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Dealers are not authorized to modify this Warranty or to make any additional commitments. Skutt will not be responsible for promises not contained in this Warranty.

State Law Rights. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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