



# **Orton**

## **Vent Master**



# **Installation and Operating Manual**

Read these instructions before installing or operating the Orton Vent Master System.

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# Specifications

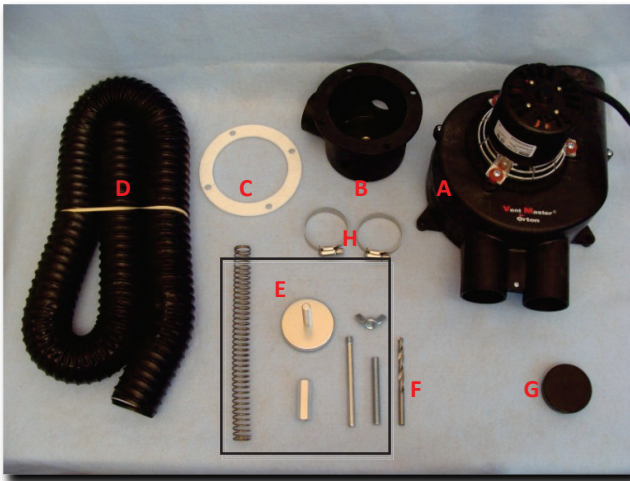
Orton manufactures two different Vent Master Systems:

115 Volt	208 - 240 Volt
115V, 60Hz, 1.1 amp	208-240 V, 50/60 Hz, .5 amp
73 CFM (cubic feet per minute) Normal room conditions will replenish air, makeup air system not necessary.	
8' power cord. Contains inline switch and plugset.	8' power cord. No plugset or inline disconnect. (must be wired per local electrical code)

## NOTES:

The Vent Master System is designed for use with electric powered kilns, and should **NOT** be used on a gas fired kiln.

The Vent Master System is designed to remove fumes generated from firing byproducts. It will not regulate room temperature.



## Unpacking

### Contents of Orton Vent Master System Kit

- A - Fan Assembly (Blower Housing)
- B - Collector Cup
- C - High Temperature Gasket
- D - 2" diameter high temperature black flex hose

- E - Adjustable Foot Kit (spring, pedestal, coupling, smooth stud, threaded stud and wing nut)
- F - (1) 1/4" drill bit
- G - (1) Plastic Cap
- H - (2) 2" hose clamps

**PLUS:**

- Sample pack of Pyrometric Cones
- Cone and Firing Booklet
- Kiln Safety Booklet

# Installation

## Additional Items Needed For Installation

- Screwdriver
- Electric Drill (if your kiln has a steel plate on the bottom)
- Vacuum Cleaner
- Dryer Vent Kit (containing flexible aluminum hose and 4" diameter hose clamp). Available from hardware and home center stores.

**NOTE:**

When selecting a dryer vent kit, the vent flap should be lightweight enough to be blown open easily. The pipe must be long enough to go through an outside wall.

## Step 1 - Determine Number and Size of Holes

Use the following chart to determine the appropriate number of holes to make in the lid and floor of your kiln. As a general rule, you should have one 1/4" hole for every four cubic feet of kiln volume.

Kiln Volume (cu ft)	Multisided or Round Kilns			Rectangular Kilns			# of Holes
	sides	diameter	depth	length	width	depth	
1 - 2	8	17.5	12	12	12	18	1
2 - 4	8	17.5	27	18	18	18	1
4 - 6	8	17.5	31.5	20	20	20	2
4-6	10	23.5	18 - 24	30	20	24	2
6 - 8	10	23.5	27	24	24	24	2
8 - 10	10	23.5	31.5	22	16	44	3
10 - 12	12	28	27 - 31.5	24	24	36	3
12 - 14	12	28	36				4
	Oval	25 X 27	37				4

(Kiln volume is given in cubic feet. All other dimensions are given in inches.)

## Step 2 - Determine Placement of Exhaust Holes

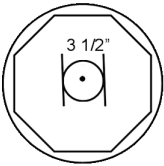
Unplug your kiln before beginning installation. If your kiln is a multiple ring design, you may wish to remove the top ring(s) to make drilling through the floor of the kiln easier.

If your kiln is supported by a metal plate, you will need to use an electric drill. For standard firebrick or refractory fiber kilns, the drill bit can be rotated by hand OR firmly support the floor of the kiln on a piece of scrap wood and use an electric drill to slowly drill through the floor into the wood. Precision and care is important. Vacuum out any dust that gets in your kiln during the drilling process.

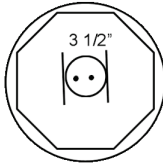
Use the following diagram to determine where to place the holes in your kiln floor. Make certain that the holes are close enough to be contained into the opening of the Vent Master collector cup (within a 3 1/2" diameter circle.) For oval kilns 12 cubic feet or greater, you can improve performance by using 2 collection cups.

### Round Kiln

#### 1 Hole



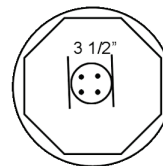
#### 2 Holes



#### 3 Holes

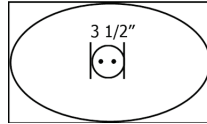


#### 4 Holes

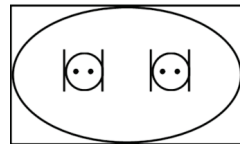
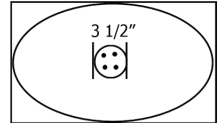


### Oval Kiln

#### 2 Holes



#### 4 Holes



1/3 | 1/3 | 1/3 |  
Oval Kiln - 2 Cup Option

## Optional Side Mounting

The collector cup is designed so that it can be mounted underneath the kiln or on the side of the kiln using sheet metal screws. When side mounting the collector cup, it is best to place it on the backside near the bottom of the kiln. A hole(s) will need to be drilled from the inside of the kiln through the skin of the kiln and care must be taken to avoid damaging the heating elements. The collector cup and gasket must be centered over the hole(s) and secured with sheet metal screws.

If your kiln is larger than 4 cubic feet and you prefer to drill only one hole in the bottom / side of the kiln rather than multiple 1/4" holes, the following table can be used.

## Optional “One Hole” Equivalents

# of 1/4” holes (based on kiln size)	Optional single hole equivalent
2	3/8”
3	7/16”
4	1/2”

**NOTE:**

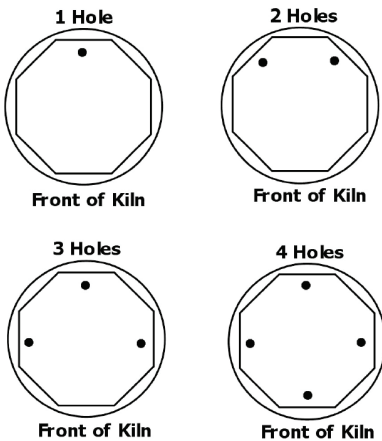
Do not drill with the Vent Master installed under the kiln, dust and drilling particles may damage the motor.

### Step 3 - Determine Placement of Air Intake Holes

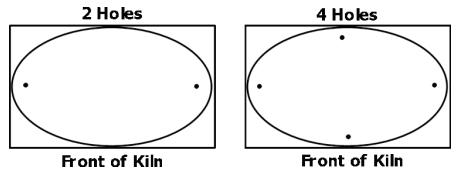
You will drill the same size and number of holes in the kiln lid as described in Step 1, however location of the holes will be different. If your kiln has an existing hole in the lid, it will need to be closed. You can use refractory cement or a refractory brick to block the hole.

Use the following diagram to determine where to place 1/4” holes in the lid of the kiln. Drill holes about 2-3” inside the edge of the firebrick. Be certain the holes open into the firing chamber, not the kiln wall.

#### Round Kiln



#### Oval Kiln



**NOTE:**

Vacuum out any brick dust that was generated during drilling, dust and drilling particles may damage the motor.

## Step 4 - Vent Master Assembly

The collector cup and gasket can be installed under the kiln using one of three options:

**Option 1: Spring Loaded Pedestal** – Use the pedestal, coupling, and smooth stud along with the spring as seen in the pictures.



Start



Add Spring



Completed  
Spring Loaded Pedestal

Position the compressed assembly under your kiln so that the holes you drilled in the bottom will be within the inside area of the collection cup. The spring will extend to hold the cup and gasket against the bottom of the kiln.

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Completed Fixed  
Position Pedestal

**Option 2: Fixed Position Pedestal** – Assemble the pedestal, coupling and threaded stud along with the wing nut as shown.

This option will hold the cup firmly in place under the kiln. The assembly height should be adjusted to fit within the space under the kiln. The wing nut is tightened under the cup to prevent movement.

**Option 3: Sheet Metal Screws** – If your kiln has a steel plate on the bottom, you can choose to attach the cup using 4 self-tapping sheet metal screws (not provided). For this option, no pedestal is required.

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### **NOTE:**

The white gasket should be installed between the kiln and the collector cup for all installations.

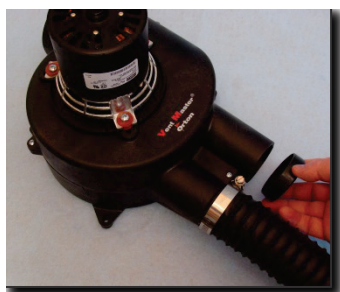


### **Attach the hose to the Collector Cup**

Attach the black high temperature hose to the collection cup with one of the metal clamps. Tighten the clamp with a flat head screwdriver or 1/4" nut driver.

### **Attach the hose to the blower assembly**

Attach the hose to the collector cup, securing it with a metal clamp. Tighten the clamp with a flat head screwdriver.



Place the blower housing at least 6 inches from the kiln or mount it onto the wall and plug Vent Master into power outlet



## Step 5 - Testing the Vent Master (Match Test)



Begin, by turning on the vent. Be certain the power to the kiln is off. Place a lit match directly over and level to one of the lid holes. The flame from the match should be gently pulled into the kiln, as illustrated. If you are unsure of the effect of the draft, observe the action of the flame away from the hole, then move back to the hole.

If the flame is not pulled into the kiln, the kiln is not venting properly. See *“Troubleshooting - The kiln is not venting”*. This test should be done regularly to ensure the Vent Master continues to operate correctly.

**NOTE:** The test does not work when the kiln is hot.

## Using Vent Master

### Basic Operation

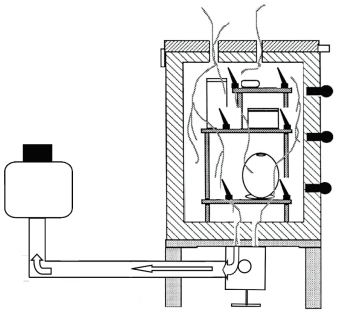
To begin operation, turn the Vent Master on using the inline switch (110 V only). Close the lid of the kiln, plug all peepholes, and fire as you normally would. You may temporarily open any one peephole during firing to check the bending of cones and the progress of your firing, however the lid and other peepholes should remain closed.

**NOTE:**

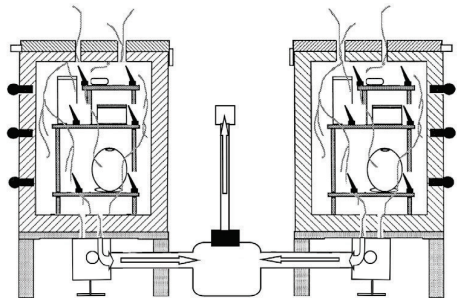
Propping open the kiln lid or leaving peepholes open will prevent the vent from working properly. This will allow fumes to enter the room.

### How Vent Master Works

The Vent Master pulls air into the kiln through holes in the lid as air is drawn out of the kiln at the bottom. This downdraft method causes the air pressure inside the kiln to be slightly lower than outside the kiln. As a result, nearly 100% of the fumes generated are removed.



Single Kiln



Dual Kilns

**NOTE:**

**An Expansion Kit should be purchased to vent:**

- 2 Kilns with combined volume not exceeding 20 cu ft
- Oval Kilns exceeding 12 cu ft but not exceeding 20 cu ft

Extensive test firings using the Orton Vent Master were done for bisque and glazed ware and no detectable odors were found. Reports from users firing lusters and other odorous products have been very positive, with respondents delighted that the ventilation system could eliminate even these very strong odors.

The design of the ventilation system includes a safety factor to handle even more difficult problems; however, if odor does occur, an additional 1/4" diameter exhaust hole can be added in the floor (or side if collector cup is side mounted) of the kiln.

**NOTE:**

Do not create more than four (4) 1/4" diameter holes.

Holes drilled in the floor of the kiln allow fumes to be pulled out of the kiln, while holes in the lid allow fresh air to enter. With the kiln lid and peepholes closed throughout the firing, negative pressure in the firing chamber insures complete fume removal. Fumes are diluted and exhausted to the outside through ducting.

### Ducting

Up to 60 feet of 4" diameter duct containing four 90° 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. Ducting can also make straight vertical climbs, as exhausted fumes will be warmer than room temperature and will rise naturally.

Suitable ducting materials include:

PVC Schedule 40, heavy duty flexible aluminum, and galvanized metal.

**The following table should be used in determining the maximum length of 4" diameter exhaust pipe recommended for proper installation.**

maximum length in feet	maximum # of 90° bends
100	0
90	1
80	2
70	3
60	4

**NOTE:**

When properly installed, the exhaust air temperature should not exceed 160°F

## Fresh Make-Up Air

During firing, you must have a source of fresh air to replace the air vented out. The Vent Master discharges approximately 73 cubic feet of air per minute. If needed, open a window or leave a door slightly ajar for make-up air.

## During Cooling

Continuing to run the Vent master during cooling is optimal. Leaving the vent on will permit the kiln to cool in less time and may give you access to your ware sooner.

# Test Firing With Cones

Your Vent Master includes Orton's #06 Self-Supporting Pyrometric Cones to be used to help evaluate the firing performance of your venting system. These are made in compacts (joined together at a parting line) and must be separated prior to use. Please refer to our website ([www.ortonceramic.com](http://www.ortonceramic.com)) for detailed information on the properties, uses, and behavior of Orton Pyrometric Cones.

Following the installation of the Vent Master, a test firing using the Self-Supporting #06 Pyrometric Cones should be made to determine the overall firing performance of the kiln. Place one cone on different shelves near the center of the shelf and near the edge. Per the firing instructions from the kiln manufacturer, complete a cone 06 firing. After the firing, examine and compare the bend of each cone by location. Differences in bend will show the magnitude of any hot or cold spots in the kiln.

Typically, the Vent Master will minimize variations and the cones should deform to near the same position. Use of these witness cones placed on each shelf of the kiln during every firing will confirm that your ware has been fired properly and will advise you of any changes in the firing performance of your kiln before significant problems develop.

# Resources

## Troubleshooting - Smell or odor coming from kiln

### Possible Cause

### Solution

Possible Cause	Solution
Insufficient airflow	Check that collector cup is positioned under exhaust holes and the holes are unobstructed. Make sure bottom shelf is supported 1" above the floor of the kiln to allow for proper circulation.

Wrong number of holes or Incorrect sized holes or Holes in wrong location	Refer to Step # 1 of this manual.
Kiln is not adequately sealed	Close all peep holes and seal, where possible, any cracks or gaps around the kiln.
Holes in hose or duct	Repair or replace duct or hose.
Obstruction in ductwork	Clear holes and hoses of any obstructions. Make sure flapper on dryer duct is not stuck.
Kiln loaded with too much ware	Reduce load.
Firing too fast	Slow heating rate to less than 150°C/hr

### Troubleshooting - Kiln is not venting

Possible Cause	Solution
No power	Make sure vent is plugged in and the switch is "on". Check circuit breaker in electrical panel.
Motor / wiring burnt out	Replace motor, see Warranty for details.

### Troubleshooting - Kiln slow to reach target temperature

Possible Cause	Solution
Kiln is not adequately sealed	Repair any cracks, holes or gaps in the kiln.
The kiln heating elements are worn out	Replace heating elements.
Too many holes or holes drilled too large in kiln	Refer to Step # 1 of this manual.

### FAQ

**Q:** What is the temperature of the air inside the ductwork?

**A:** When properly installed, the maximum temperature in the ductwork will not exceed 160°F. The air temperature will be similar to the air exhausted by a clothes dryer.

**Q:** Will I need a insulated pipe in the wall?

**A:** There is no need for insulated ductwork. Use of 4" diameter flexible aluminum ductwork is recommended.

**Q:** I am venting one kiln. What do I do with the second hole on the blower?

**A:** If not in use, the second hole can be left open or covered using the plastic cap provided.

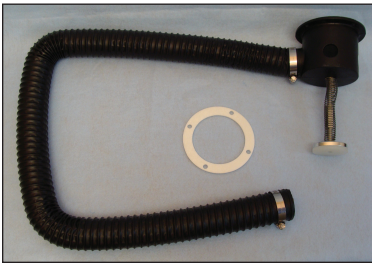
**Q:** Will the fumes coming through the vent damage my plants, the neighborhood pets or disturb the local environment?

**A:** No. The fumes and the gases coming from the kiln have been diluted with enough fresh air to make them safe.

Additional troubleshooting and FAQ resources are available online at:

[www.ortonceramic.com](http://www.ortonceramic.com)

## Optional Parts



### Expansion Kit (for venting two kilns)

Complete Collector Cup Assembly  
High Temperature Black Flex Hose  
(2) 2" Hose Clamps



### Hose Kit

2" Coupling  
High Temperature Black Flex Hose  
(2) 2" Hose Clamps

# Limited Warranty

This limited warranty is given only to the immediate purchaser ("Buyer") of the Vent Master System ("Vent Master System"). This limited warranty is not transferable. The Edward Orton Jr. Ceramic Foundation ("Orton") warrants the blower housing and electric motor contained within the Vent Master System ("Warranted Components") to be in good working order under normal operating conditions for a period of one (1) year from the date of purchase. Should the Warranted Components fail to be in good working order at any time during the stated one (1) year period, Orton will, at its option, repair or replace the Warranted Components as set forth below. The liability of Orton is limited to replacement and/or repair at its factory of the Warranted Components that do not remain in good working order. Repair parts or replacement products will be furnished on an exchange basis and will be either reconditioned or new. All replaced parts and products become the property of Orton. Following receipt of notice from Buyer of a valid warranty claim and the Vent Master System containing the Warranted Components, Orton will perform its obligations under this limited warranty within 10 business days.

Limited warranty service may be obtained by delivering the Vent Master System during the warranty period to your Orton Vent Master System supplier or to The Edward Orton Jr. Ceramic Foundation, 6991 Old 3C Highway, Westerville OH 43082 and providing written proof of purchase and description of the defect or problem. Buyer must insure the shipment of the Vent Master System or assume the risk of loss or damage in transit, prepay shipping charges to the service location, and use the original shipping container or equivalent. Buyer will be responsible for shipping and handling charges in excess of US \$50.00 incurred by Orton in returning the Vent Master System to the buyer after completion of limited warranty service.

This warranty does not apply to any damage resulting from:

1. Operation beyond electrical rating.
2. External sources including, but not limited to, chemicals, heat abuse and improper care.
3. Improper or inadequate maintenance by Buyer.
4. Parts or equipment not supplied by Orton.
5. Unauthorized modification, disassembly, or misuse.
6. Operation outside environmental specifications.
7. Improper installation.
8. Firing of kiln with the Vent Master System installed, but not operating, during the firing cycle.
9. Overfiring (melting of materials being fired) regardless of the cause of the firing.

Warranted Components returned for service where no warranted defect is found will be subject to service, and shipping and handling fees.

If the Warranted Components are not in good working order as warranted above, Buyer's sole remedy shall be repair or replacement of the Warranted Components as provided above. To the extent permitted by law, ALL EXPRESS AND IMPLIED WARRANTIES FOR THE WARRANTED COMPONENTS INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE ONE YEAR WARRANTY PERIOD COMMENCING ON THE DATE OF PURCHASE, AND NO OTHER WARRANTY, WHETHER EXPRESS OR IMPLIED, WILL APPLY TO THIS PERIOD. To the extent permitted by law, ORTON'S LIABILITY AND BUYER'S SOLE REMEDY IS LIMITED SOLELY AND EXCLUSIVELY TO REPAIR OR REPLACEMENT AS SET FORTH HEREIN. ORTON SHALL NOT BE LIABLE FOR, AND BUYER'S REMEDY SHALL NOT INCLUDE ANY INCIDENTAL, CONSEQUENTIAL, OR OTHER DAMAGES OF ANY KIND WHATSOEVER, WHETHER A CLAIM IS BASED UPON A THEORY OF CONTRACT, NEGLIGENCE OR TORT. Buyer shall determine suitability of the Vent Master System for the intended use and assume all risk and liability therewith. Some states do not allow this exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from State to State.

The above limitation of liability does not apply in the event that any Warranted Components are determined by a court of competent jurisdiction to be defective and to have directly caused bodily injury, death or property damage; provided that in no event shall Orton's liability exceed the greater of \$1000.00 or the purchase price of the specific Vent Master System that caused such damage.

Service may also be obtained on Warranted Components no longer under warranty by returning the Vent Master System prepaid to Orton with a brief description of the problem and Buyer's name and contact information. Buyer will be contacted with an estimate of service charges before any work is performed.

## **Customer Satisfaction Policy**

If, for any reason, you are not completely satisfied with the performance of the Orton Vent Master System or the conditions of this warranty, return the Vent Master System in good working condition, transportation and insurance prepaid, within 30 days of purchase date to your Orton Vent Master System supplier or to The Edward Orton Jr. Ceramic Foundation, 6991 Old 3C Highway, Westerville, OH 43082 and your purchase price will be refunded. Prior to returning your Vent Master System, contact Orton for an authorization number and include with your shipment. For Vent Master Systems ordered in error, a restocking charge will apply.

### **IMPORTANT NOTE:**

RETAIN PACKING SLIP OR COPY OF SALES RECEIPT FOR WARRANTY PURPOSES

## **Contacting Orton**

The Edward Orton Ceramic Foundation  
6991 Old 3C Highway  
Westerville, Ohio USA 43082

Telephone: 614-895-2663  
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Web: [www.ortonceramic.com](http://www.ortonceramic.com)  
Email: [info@ortonceramic.com](mailto:info@ortonceramic.com)

# About The Orton Ceramic Foundation

Helping the Ceramic Community grow since 1896.



In 1896, Professor Edward Orton Jr. began the Standard Pyrometric Cone Company, manufacturing pyrometric cones at The Ohio State University, Columbus, Ohio USA. These cones quickly became the standard by which firings were monitored and controlled, as they often are today.

Because of his interest and commitment to advancing the ceramic arts and industries and his desire to have high quality pyrometric cones always available for monitoring and control of the firing process, Orton left his company as a nonprofit trust. Income is used to develop and disseminate technical information that helps solve firing and other processing problems.

The Orton website (<http://www.ortonceramic.com>) provides information and technical assistance on customer-specific firing problems, as well as publications, technical notes and other related information.

## The Orton Product Line Also Includes:

### Material Testing Services

Over 80 ASTM Standard Tests for Electrical, Mechanical, Physical and Thermal Properties.



Specializing in Refractory, Glass, Whiteware and Advanced Ceramic Materials.

### Pyrometric Devices

TempCHEK® Calibrated Shrinkage Device



Standard Pyrometric Cones



### Thermoanalytical Instruments

Offering a wide selection of dependable thermal instruments, built to last and economical to purchase. Most are customized to meet your specific requirement.



- Dilatometers
- Gradient Furnaces
- Fully Automatic Glass Testing Instruments