

# Orton<sup>®</sup>

## Vent Master



### OWNER'S MANUAL

Read these instructions before you install or operate  
the Orton Vent Master System

---

The Edward Orton Jr. Ceramic Foundation  
PO Box 2760  
Westerville, Ohio 43086  
Phone: 614-895-2663  
Fax: 614-895-5610  
Website: [www.ortonceramic.com](http://www.ortonceramic.com)

# ***Congratulations on your purchase of the Orton Vent Master System!***

This manual covers the general use and installation of the Orton Vent Master System. Refer to the installation instructions for more specific details in installation.

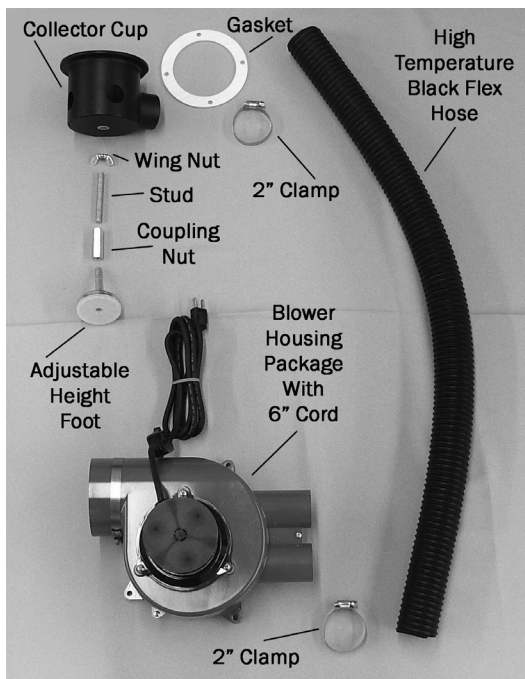
## **CONTENTS**

UNPACKING .....	2
ITEMS YOU NEED TO INSTALL.....	3
VENT MASTER INSTALLATION .....	4
- SIZE AND NUMBER OF HOLES .....	4
- HOLES IN THE KILN FLOOR .....	5
- HOLES IN THE KILN LID .....	6
- VENT MASTER ASSEMBLY.....	7
- TESTING THE VENT MASTER .....	8
VENT MASTER OPERATION .....	8
HELPFUL HINTS.....	11
ABOUT FIRING.....	13
TROUBLESHOOTING .....	15
OPTIONAL PARTS.....	16
WARRANTY .....	17
HISTORY OF ORTON.....	20

## **UNPACKING**

### **Your Orton Vent Master System kit includes:**

- Fan assembly (Blower Housing Package) with 6 ft power cord
- Collector cup with adjustable height foot
- High temperature gasket to seal collector cup to bottom or side of kiln
- 3 foot length of 2" diameter high temperature black flex hose
- Two-2" hose clamps
- One-1/4" drill bit
- One-3" stud
- Orton sample test cones
- Cones and Firing booklet
- Kiln Safety booklet



**Items you will need to install your new Vent Master:**

- . a screwdriver
- . an electric drill (if your kiln has a steel plate on the bottom)
- . a vacuum cleaner
- . duct tape (optional)
- . a dryer vent kit – (containing flexible aluminum hose and 4” hose clamp) available from hardware and home center stores

(Note: When selecting the dryer vent kit, be sure the vent flap is lightweight enough to be blown open easily and the vent pipe is long enough to go through your outside wall).

**You have the option to install the Vent Master as a positive or negative pressure system, meaning that you can install the Vent Master to push the vent exhaust (positive pressure) out of the room or you can install the Vent Master to pull the vent exhaust (negative pressure) out of the room.**

For a Positive Pressure System: Dryer Vent Kit w/sufficient length of 4” aluminum, dryer vent duct to exhaust through outside wall.

For a Negative Pressure System: Sufficient length of high temperature 2” vacuum hose to allow blower assembly to be mounted adjacent to exhaust opening in wall.

The Positive Pressure system will require the location of the blower assembly near the kiln utilizing the 3 foot section of High temperature black flex hose (can be cut to length but recommend that the blower assembly be a minimum of 6 inches from the kiln) to connect the collector cup to the blower assembly and utilizing 4 inch aluminum, dryer vent duct to exhaust to the outside. **(Do not use plastic dryer vent duct)**

The Negative Pressure system will require the blower assembly to be located near the room exhaust opening to the outside utilizing up to 25 feet of High temperature black flex hose to connect the collector cup to the blower assembly. See your Vent Master dealer for additional High temperature black flex hose.

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

## VENT MASTER INSTALLATION

### 1. DETERMINE NUMBER AND SIZE OF HOLES

Use the following charts to determine the appropriate number of holes for your kiln. As a general rule, you should have one- $\frac{1}{4}$ " hole for every 4 cubic feet kiln volume.

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

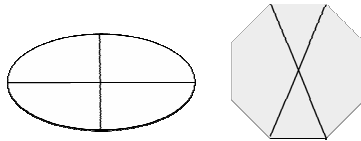
<u>Kiln</u> <u>Volume</u>	<u>Multisided or Round Kilns</u>			<u>Rectangular Kilns</u>			<u>#</u> <u>Holes</u>
<u>(cu ft)</u>	<u>sides</u>	<u>diameter</u>	<u>depth</u>	<u>length</u>	<u>width</u>	<u>depth</u>	<u>Total</u>
1 - 2	8	17.5	12	12	12	18	1
2 - 4	8	17.5	27	18	18	18	1
4 - 6	8	17.5	31.5	20	20	20	2
	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

**CAUTIONARY NOTE:** If Vent Master collection cup is to be installed on the side of the kiln, please follow the instructions regarding number of holes, but make certain **NOT** to drill holes in the side of the kiln that will intersect the heating elements. If further information is needed, please contact Orton.

**2. DETERMINE PLACEMENT OF HOLES IN KILN FLOOR**

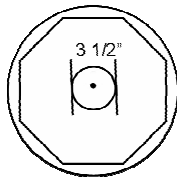
Use the diagram following to determine where to place the holes in your kiln floor. Make certain that the holes are close enough to be contained into the opening of the Vent Master collector cup, keep them clustered together within about a 3 1/2" diameter circle in the center of the kiln floor. You may use the gasket as a template.

**Use this method to help determine the center of the kiln floor**

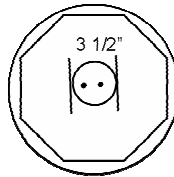


**The center is where the lines intersect**

**1 Hole**



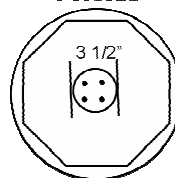
**2 Holes**

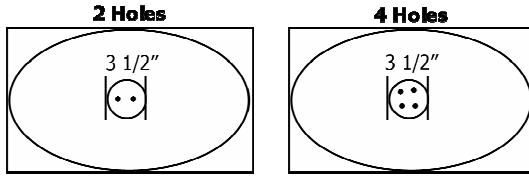


**3 Holes**



**4 Holes**





**Preparing the Kiln for Vent Master Installation**

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

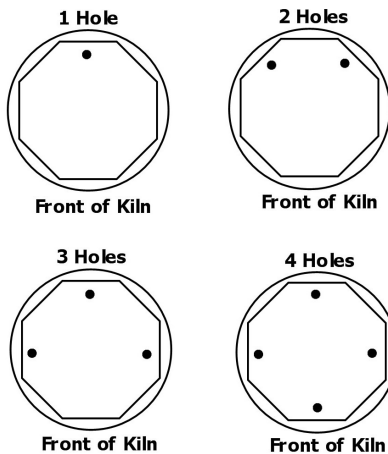
**Drilling Ventilation Holes in the Kiln Floor**

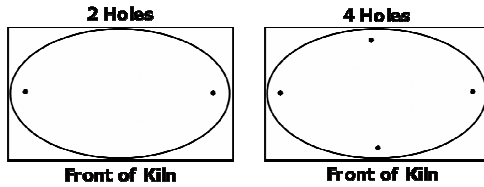
If your floor is supported by a metal plate, use an electric drill. For standard firebrick kiln floors or refractory fiber kilns, the drill bit can be rotated by hand, OR, firmly support the floor of the kiln on a piece of scrap wood and use an electric drill to slowly drill through the floor into the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

**NOTE: Do not drill holes with the kiln installed above the Orton Vent Master System - dust may damage the motor.**

**3. DETERMINE PLACEMENT OF HOLES IN KILN LID**

Use the following diagram to determine where to place the holes in the lid of the kiln. Drill the holes about 1" inside the edge of the firebrick. Be sure the holes open into the firing chamber, not into the firebrick.





### **Drilling Holes in the Kiln Lid**

You should drill the same size and number of holes for your kiln lid as you did in the floor, though the spacing is 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.

Lid holes must be above the open firing chamber, not above the kiln wall, in order to achieve proper air flow.

Vacuum out any brick dust that was generated during drilling. You are now ready to install the Orton Vent Master System.

**NOTE: The Vent Master System is specifically designed to vent air to the outside, and should not be used for any other purpose.**

## **4. VENT MASTER ASSEMBLY**

1. Determine # of holes needed and placement of holes
2. Drill holes
3. Install collector cup making certain that the holes are directly over the top opening of the cup
4. Attach hoses with metal clamps and tighten
5. Maintain a distance of at least six inches from the blower housing and the side of the kiln. Never place the blower housing under the kiln, doing so would void the warranty
6. Plug in Vent Master
7. Test air flow

**PLEASE ALSO SEE HELPFUL HINTS ABOUT INSTALLATION ON PAGE 11**

## 5. TESTING THE VENT MASTER

Use the match test, outlined below, to insure proper ventilation.

### Testing for Proper Venting - the Flame Test

To test the operation of the Orton Vent Master System, turn on the vent. Be sure the power to the kiln is off. Place a lighted match or lighter directly over and level with one of the holes in the lid of the kiln.

The flame from the match or lighter should be gently pulled into the kiln as a result of the draft, as illustrated below. If you are unsure of the effect of the draft, observe the action of the flame away from the hole, and then move it back over and level with the hole.

If the flame is not pulled into the kiln, the kiln is not venting properly. See *Troubleshooting*, pg. 15. This test should be done regularly to be sure that the Orton Vent Master System is operating correctly.



Flame is pulled into the kiln

## VENT MASTER OPERATION OPERATION

Turn Vent Master on using the in-line on-off switch, which is located on the power cord. Close the lid on your kiln, plug the peepholes, and fire as you normally would.

You can open any (one) peephole during firing to check the bending of the cones and the progress of your firing, but the kiln lid and other peepholes should be kept closed during the firing. In fact, if the lid is propped or a peephole is left open, the Vent Master will not work properly - **loss of negative pressure will allow fumes to enter the room, and the cool air drawn into the kiln may adversely affect your firing.**



Vent Master pulls air into the kiln at the top, as air is drawn out of the kiln at the bottom. See the diagram next page. This method causes the air pressure inside 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 removes essentially 100% of the fumes generated, providing:

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

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 responses 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 small hole can be added/ opened in the floor only of the kiln.

### **LENGTH OF DUCTING**

Up to 60 feet of ducting 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. Do not worry about straight vertical climbs. The exhausted fumes will be warmer than room temperature, and will rise naturally.

**This following table should be used as a helpful guide in determining the maximum length of 4" exhaust pipe recommended for proper installation.**

<b>Maximum Length in feet</b>	<b>Maximum Number of 90° Bends</b>
<b>100</b>	<b>0</b>
<b>90</b>	<b>1</b>
<b>80</b>	<b>2</b>
<b>70</b>	<b>3</b>
<b>60</b>	<b>4</b>

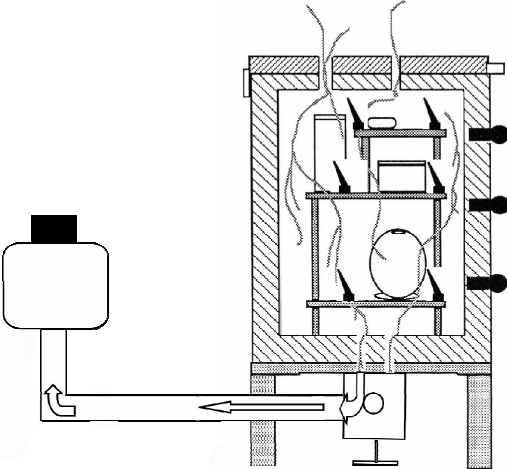
### **FRESH MAKE-UP AIR**

During firing, you must have a source of fresh air to replace the air vented outdoors. The Orton Vent Master System fan discharges approximately 60-80 cubic feet per minute. If needed, open a window or leave a door slightly ajar for make-up air.

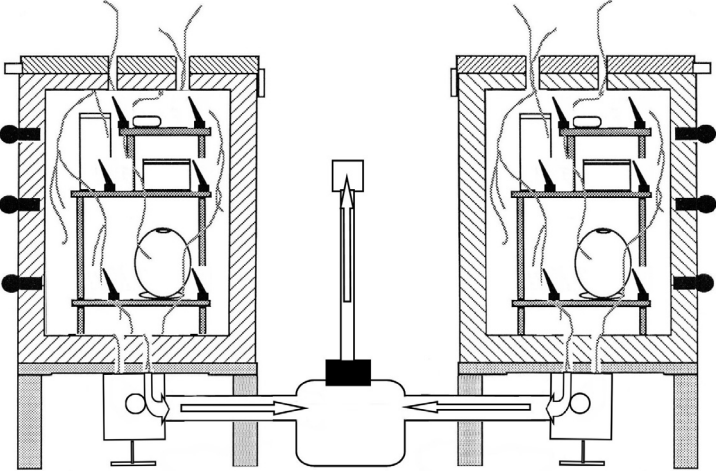
**DURING COOLING**

It is suggested that you leave the Orton Vent Master System switch in the **on** position during cooling. This will permit the kiln to cool more quickly at lower temperatures and give you access to your ware sooner.

**HOW VENT MASTER WORKS  
(SINGLE KILN)**



**(DUAL KILNS)**

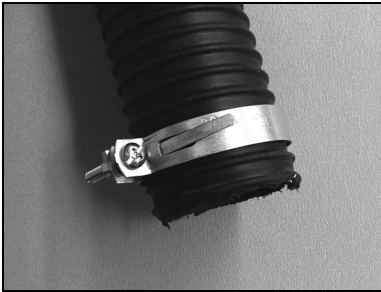


1. Holes drilled in floor of the kiln allow fumes to be pulled out of the kiln, while holes in lid allow fresh air to enter.
2. Kiln lid and peepholes remain closed throughout the firing.
3. Negative pressure in the firing chamber insures complete fume removal.
4. Fumes are diluted and exhausted to the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

**NOTE: An expansion kit should be purchased to vent:**

- Two kilns with a combined firing volume not exceeding 20 cubic feet
- Oval kilns exceeding 12 cubic feet but not exceeding 20 cubic feet

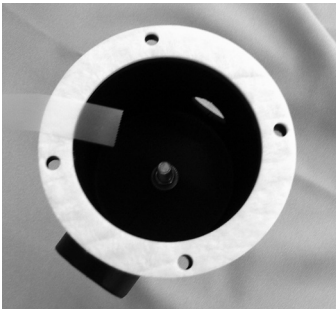
**HELPFUL HINTS  
ABOUT INSTALLATION**



High temperature black flex hose and clamp



Collector cup with gasket, adjustable height foot, stud, coupling and wing nut



Gasket installed on collector cup (use tape to keep in place)



High temperature black flex hose attached to collector cup



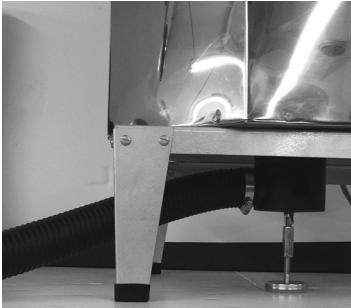
**High temperature black flex hose attachment to blower housing**



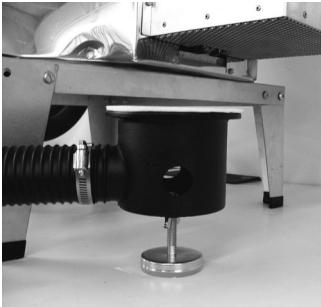
**Drill holes in kiln floor with drill bit provided**



**Drill holes in kiln lid with drill bit provided**



**Under kiln mount with height adjustment**



**Under kiln mount with no height adjustment**



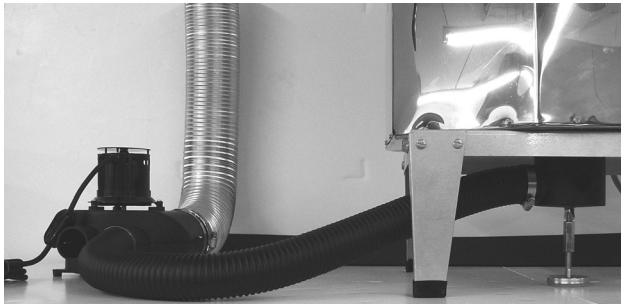
**Side kiln mount of collector cup**



**Optional wall mounting**



**Complete wall mount  
typical set up**



**Typical floor mount set up**

## **ABOUT FIRING:**

### **TEST FIRING**

You have been supplied with Orton's #06 Self-Supporting cones to be used to help evaluate the firing performance of your venting system. These cones are made in compacts (joined together at a parting line) and must be separated prior to use. Please refer to our website 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 cones supplied, 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 also near the edge. Per the firing instructions from the kiln manufacturer, make 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 should minimize variations and the cones should deform to near the same position. Use of witness cones placed on each shelf of the kiln during every firing will confirm that your ware was fired properly and advise you of any changes in the firing performance of your kiln(s) before significant problems develop.

## **MAXIMIZE YOUR KILN PERFORMANCE USING QUALITY ORTON PRODUCTS**

### **Vent Master**

#### ***Downdraft Venting***

Downdraft venting of electric kilns was invented by Orton. It is the only venting method to improve firing conditions in the kiln while removing essentially all fumes. It works by continuously pulling a small amount of gas out of the kiln. This gas is mixed with room air and exhausted outside. Vent Master produces many good results:

- Removes fumes during firing
- Improves firing: true colors, better carbon burnout
- Extends life of heating elements
- Improves temperature uniformity
- Easy to install
- Eliminates propping kiln lid
- Inexpensive to operate
- Can reduce kiln cool-down by 4-10 hours
- Use for any type of kiln

### **Orton Pyrometric Cones**

#### ***Monitor your firing with Orton Cones***

- Cones measure the amount of heat available
- Self-supporting cones don't need plaques
- Determine when firing is complete
- Measure temperature uniformity in kiln
- Use to check performance of electronic controllers
- Use to check shut-off of Kiln Sitter™
- Use to compare firings

### **Autofire™ Controllers**

#### ***Take control of your kiln and your time.***

Controllers are reliable products developed by Orton to improve temperature uniformity while providing more accurate control of the firing. Existing kilns can be retrofitted for operation with Orton Autofire™ controllers.

Compare Autofire™ Features:

- Better kiln control
- Easy-to-use preset cone firing programs
- 3-touch firing to a cone number
- 4 user programs with 10 ramps each
- Use type K, N or S thermocouples
- Programmable Vent Master control
- Hand-held programming
- ControlMaster software to interface with computer
- Diagnostics for determining source of problem
- Computer support and 1 year warranty
- Monitor up to 16 kilns from a computer

## TROUBLESHOOTING THE ORTON VENT MASTER

### Problem: Smell or odor coming from kiln

**Cause:** Insufficient airflow

**Solution:** 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

**Cause:** Wrong number of holes drilled in bottom of kiln, incorrect size holes, or holes drilled in wrong location.

**Solution:** Refer to installation step number 1 on page 4 of this manual

**Cause:** Kiln is not sealed sufficiently

**Solution:** Close all peep holes and seal, where possible, any cracks or gaps around the kiln

**Cause:** Holes in exhaust hose or duct

**Solution:** Repair or replace duct or hose

**Cause:** Obstruction in exhaust ductwork

**Solution:** Clear holes and hoses of any obstructions. Make sure flapper on dryer duct is not stuck

**Cause:** Kiln loaded with too much ware

**Solution:** Reduce load

### Problem: Kiln not venting at all

**Cause:** No power

**Solution:** Make sure vent is plugged in and switch is "on". Check circuit breaker in electrical panel

**Cause:** Motor or wiring burnt out

**Solution:** Replace motor, see Warranty for details

**Problem: Kiln slow to reach target temperature**

**Cause:** Kiln is not adequately sealed

**Solution:** Plug or repair any cracks, holes or gaps in the kiln

**Cause:** Heating elements worn out

**Solution:** Replace heating elements

**Cause:** Too many holes or holes drilled too large

**Solution:** Refer to installation step 1 in this manual

For additional help, refer to our website  
[www.ortonceramic.com](http://www.ortonceramic.com) . Look in the Resources section and  
you will find our frequently asked questions page.

**Optional Parts:**

**Expansion Kit (For Venting Two Kilns) Includes:**

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

**Extender Kit Includes:**

2" Coupling  
3' Length High Temperature Black Flex Hose  
(2) 2" Hose Clamps

For Support or Questions, Contact us at:

[info@ortonceramic.com](mailto:info@ortonceramic.com)

or call or fax:

Phone: 614-895-2663

Fax: 614-895-5610

**THANK YOU FOR YOUR PURCHASE!**



## 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 or misuse.
6. Operation outside environmental specifications.
7. Improper installation.
8. Firing of kiln with Vent Master System installed but not operating during 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**

## THE HISTORY OF ORTON PRODUCTS

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. Orton's website provides information and technical assistance on customer-specific firing problems, as well as publications, technical notes and other related information.

The Orton product line includes a full range of Kiln Monitoring Products, Venting Systems for electric kilns, Testing Services and Laboratory Instruments.