

Quizno's Hood Submittal Documents

Qvent™

Qvent™ is a custom ventilation solution engineered specifically to vent Holman MM14 conveyor warmers used in Quizno's operations. The process of warming a Quizno's sandwich in the specially designed Holman MM14 conveyor warmer is not a cooking process. With a maximum attained product surface temperature of 130°F, and insignificant volume of effluent.



Type II application

The Quizno's process of warming sandwiches in the Holman MM-14 conveyor warmer produces far less than the allowable amounts of grease and smoke stipulated by industry standards (EPA 202). The EPA 202 method was originally intended for recirculating hood systems and as such, defines a threshold level value (TLV) of condensable particulates as a concentration of $5\text{mg}/\text{m}^3$. A two-slice bread toaster is capable of producing "smoke" if cycled too long or if the lift mechanism should fail. Though no one would argue that a toaster could produce smoke, there is no fire hazard due to its insignificance. No jurisdiction has required a hood or special ventilation for a two slice toaster even though each of the various model codes (IMC, UMC, BOCA, SBCCI) states "a Type I hood shall be installed at or above all commercial food heat-processing appliances that produce grease vapors or smoke". Clearly, there are TLV's of "smoke" that do not require special ventilation as there is a negligible hazard. The attached EPA 202 documentation substantiates that this specific application does not attain the TLV standards established by EPA 202.

Type I hood

Though this process is not a Type I process, **Qvent™** is in fact a UL 710 listed non-canopy style Type I hood, built to NFPA 96. The fact that we are using this style of hood for a Type II application is strictly a matter of economics. We are exceeding the minimum safety parameters established by your mechanical code. This is the same hood used by the manufacturer for many different national operations that, unlike Quizno's, are cooking operations. It is less expensive for us to provide this hood, than to create a whole new file and obtain listings from NSF for a Type II configuration. With this Type II application; there are no requirements for all welded liquid tight ducts with rated shaft-wall enclosures or fire suppression systems. Though not required to follow Type I protocol, we have recommended that an all welded duct system be provided to facilitate occasional cleaning (according to master cleaning schedule) with pressurized water. A major advantage of the **Qvent™** concept is that the vent inlets are in close proximity to the heat source (directly above the tunnel outlets) with minimal entrainment of room air. This is the ideal situation to capture and contain excess heat, moisture and odor.



Qvent Bullet Pointers

1. The Quizno's sandwich warming process is what is known as a Type II process and does not generate smoke and grease laden vapor. The Qvent submittal package details the intended use and installation methods for this system in Quizno's operations.
2. Always visit <http://www.qvent.com> to download fresh submittal packages and project worksheets. Deliver this complete submittal package at time of application for permit to the local building code authority. This [website](http://www.qvent.com) is also where you will find the installation and owners manuals, along with cleaning, maintenance and other helpful information for the hood, filters, duct and fan.
3. The duct section provided and installed by the mechanical contractor MUST be leak proof and provide for cleaning access. Never use galvanized drive and sleeve, or flexible ducts for a Qvent system. Weld contractor supplied duct section to the stainless steel duct section that came with Qvent.
4. Always verify the contractor is supplying adequate make up air as documented in the submittal package. Without adequate make up air, or fan will not operate properly, and unsafe conditions may ensue.
5. Verify that all stores have the following cleaning schedule:
 - a. Wash filters daily in three compartment sink; clean external hood surfaces with mild soapy detergent. Inspect and clean interior of the hood as needed.
 - b. Hire licensed duct-cleaning firm to clean (high pressure water spray) the interior of duct at least once per year. Make sure they inspect the fan at the same time. A list of duct cleaning companies is on [Qvent website](http://www.qvent.com).
6. Contact us if you are having problems with a building, fire or health department official relating to the Qvent system. Call Tom Johnson at 800-676-8488x101 for help with officials and submittals; call Paul Johnson at ext 111 for help entering, expediting, changing or modifying an order and for all specials.

For a great overview of the install, check out the installation animation found at www.qvent.com. Thank you. Johnson Diversified Products, Inc 800-676-8488

Duct

One of the components covered of the system is a 88" length of 18ga MSG liquid tight welded Stainless Steel (SS) duct that will connect to the duct collar. This duct section shall be field welded to the duct collar and then extend up to at least 6" above finished ceiling. A reflective ceiling panel needs to be removed, cut, and then fitted with the (provided) SS escutcheon (frame). The hood end of the duct (inlet) is then inserted through the frame and welded to the hoods duct collar. On the discharge end of the duct we are providing some welded angles to enable connection of hanger rods to provide structural support to the duct and hood. It is important to have a 1/8-1/4" gap from the bottom of the hood to the top of the oven. The installing contractor shall provide and install the liquid tight welded 16ga black iron duct section that will close from the discharge side of our SS duct section to the fan, following local code requirements for Type II systems.

Replacement air

Due to the proximity of the filters to the conveyor warmer, only low exhaust volumes (<1000CFM) are needed. Bathroom venting is usually about 250CFM (125CFM each for men's and women's). Add those values to our recommended 800CFM and the total exhaust for the store is 1050CFM. The average Quizno's store has approximately 1,300sq feet of floor space. With structural ceilings at approximately 15' the typical store envelope holds about 19,500 cubic feet of air. To hold the space with a slight negative (.02"W.C.) the HVAC system must be capable of providing roughly 750CFM of tempered (and air conditioned) fresh air. Note that one cubic foot of 68°F air heated to 165°F becomes 1.184 cubic feet of air due to The Ideal Gas Law. Negative pressures beyond .02"W.C. may be dangerous as gravity vented natural gas fired equipment (eg., hot water heaters) may develop back draft conditions which may create a carbon monoxide (CO) problem. For those stores that have roof top unit (RTU) HVAC systems we recommend the use of a 8.5 –12 ton RTU (depending upon store size, design climate and store orientation) with a secondary minimal set-point controller and potentiometer. When the exhaust fan is on, a signal is sent to the RTU and the secondary minimal set-point controller will open the fresh air dampers on the economizer to full open (must be set by contractor upon installation). These dampers will provide between 600-900CFM fresh air (tempered or air conditioned) depending upon the size of the RTU. This is ideal to compensate for the volume of air exhaust by *QventTM*

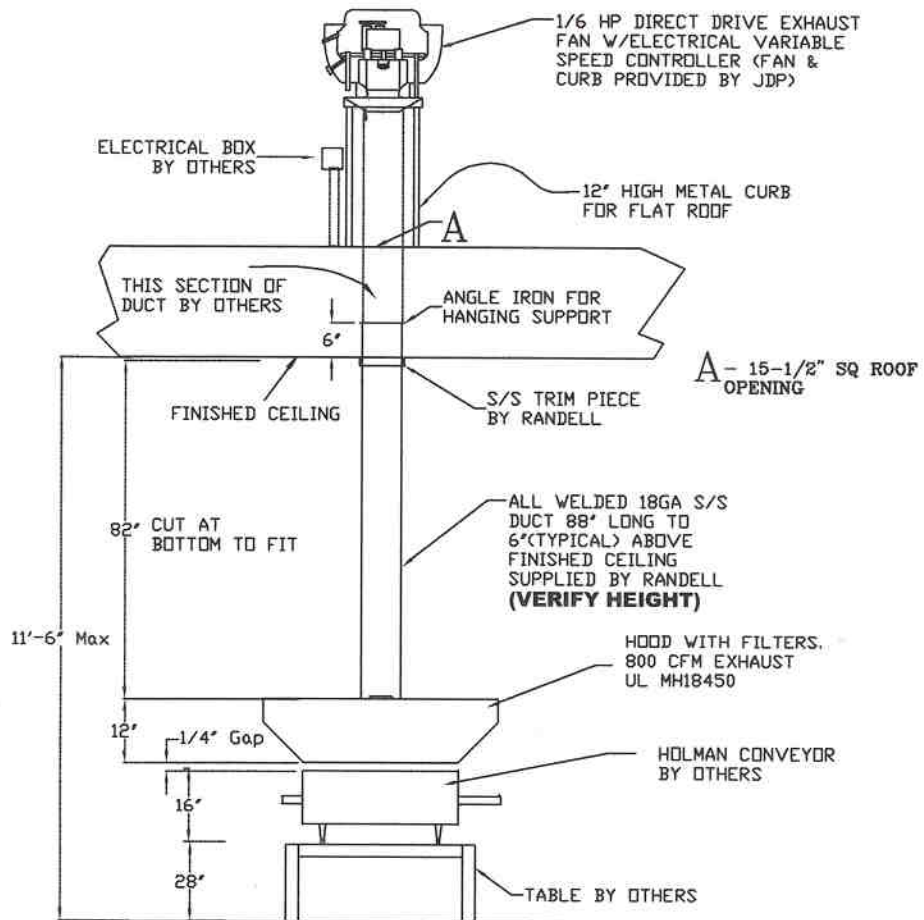
Exhaust Fan

The *QventTM* exhaust fan has a solid-state variable speed controller that enables an increase or decrease in exhaust volumes based upon current in-store conditions. The electrician shall provide 115/60/1 4.4amp (1/6hp) on the roof. There is also a variable speed control dial that needs to be wired into the wall in the kitchen area with leads going to the fan J box. The ability to vary exhaust volumes will come in handy between peak demand and idle periods. This fan will move up to 1100CFM air, which will work for your double oven situations. Duct runs greater than 20 feet, with offsets, or sidewall discharge will require the use of a larger fan.

Documentation

Please find the attached documents:

1. EPA 202 testing from air and filter testing laboratories
2. Randell Manufacturing's drawing of hood and duct section



QUOTE #
QUIZINOS
ORDER #
*
SHT
1 OF 1
SCALE
1/2" = 1'-0"

SALES CONTACTS	REVISION DATES
DESK. DATE: 04/25/99	

QUIZINOS
JOHNSON DIVERSIFIED

Q\VENT SYSTEM

Randell
A JOHNSON DIVERSIFIED COMPANY

6520 South Colchester Road
Vicksburg, Michigan 49093-9683
Phone 1-800-521-6368
Fax 1-800-534-3363

APPROVED DRAWING REQUIRED
BEFORE FABRICATION

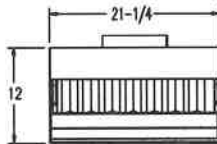
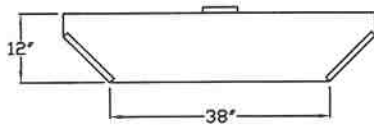
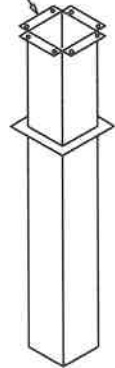
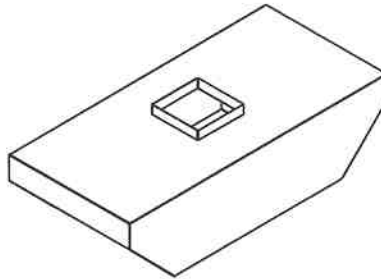
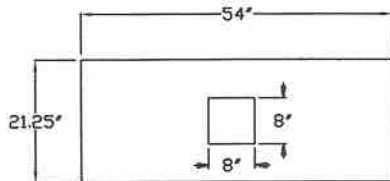
☐ DRAWING APPROVED
☐ APPROVED AS NOTED
☐ RESUBMIT DRAWING
SCHEDULED SHIP DATE:

SIGNATURE: _____

NOTES:
1. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.
2. ALL DIMENSIONS ARE TO BE VERIFIED BY THE FABRICATOR.
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DATE: _____

8" X 8" 18 GA S/S DUCT EXTENSION
WITH 1 1/2" WIDE PERIMETER CEILING TRIM
AND (4) 1 1/2" ANGLE X 6" LONG HANGING BRKTS
VERIFY HEIGHT REQUIREMENTS



Hood Item No.	Hood Length (in)	Hood Width (in)	Hood Weight (LBS)	Exhaust Rate (JUNFL)	Exhaust CFM	Exhaust Duct Size (in)	Exhaust Duct Velocity (FPM)	Net Filter Area (SQ.FT)	Velocity Thru Filter (FPM)	Exhaust Static Pressure (in)	Supply CFM	Supply Duct Size	Avg. Air Velocity Thru Diffus. (FPM)
ITEM 1	54	21.25	70	226	800	8 X 8	1818	2.0	400	.50			

GENERAL NOTES
IF YOU ARE INSTALLING A VENTILATION EXHAUST SYSTEM INTO AN AREA WHICH HAS CERTAIN CHARACTERISTICS OR CODES OTHER THAN THOSE NORMALLY ACCEPTED IN THE FOOD SERVICE INDUSTRY (NSF, UL, ETC.) RANDALL MUST BE ADVISED OF THESE REQUIREMENTS IN WRITING BEFORE FABRICATION OF THE EQUIPMENT BECAUSE FAILURE TO ADVISE RANDALL AIR SYSTEMS OF SPECIFIC REQUIREMENTS COULD RESULT IN THE JOB BEING DELAYED, ADDITIONAL COSTS, OR BOTH.

APPROVED DRAWING REQUIRED BEFORE FABRICATION
☐ DRAWING APPROVED
☐ APPROVED AS NOTED
☐ RESUBMIT DRAWING
 BY: _____ DATE: _____

ALL RANDALL HOODS MEET ONE OR MORE OF THE FOLLOWING:
 U.L.710 MH18450 2/16/99
 BOCA IC80
 NSF STANDARD(2)
 STATE OF MICHIGAN
 SBCCI NFPA 96

KEY
 SUPPLY DUCT
 EXHAUST DUCT

ORIGINAL QUOTE DATE 2/16/99
DATE QUOTE LAST REVISED
REASON
SALES Paul Johnson 800.676.8488 x111

QUOTE #		SALES CONTACT		QUIZNOS			1520 South Coldwater Road Veldman, Michigan 48893-9683 Phone 1-800-631-6368 Fax 1-508-634-5369		APPROVED DRAWING REQUIRED BEFORE FABRICATION <input type="checkbox"/> DRAWING APPROVED <input type="checkbox"/> APPROVED AS NOTED <input type="checkbox"/> RESUBMIT DRAWING SCHEDULED SHIP DATE: _____ SIGNATURE: _____		NSF <small>NSF INTERNATIONAL is a U.S. company and its products are made in the U.S. for the U.S. market only. Any other country's requirements are the responsibility of the customer. RANDALL AIR SYSTEMS is not responsible for any other country's requirements. RANDALL AIR SYSTEMS is not responsible for any other country's requirements. RANDALL AIR SYSTEMS is not responsible for any other country's requirements.</small> UL <small>UL LISTED BY: 475, 705 & 708</small> DATED: _____		
QUIZNOS		REVISION DATES											
ORDER #				QUIZNOS									
BIT				HOLMAN WARMER									
SCALE				W/VENT SYSTEM									



COOK



MARK: STD ROOF TOP

PROJECT: Q135V10DR

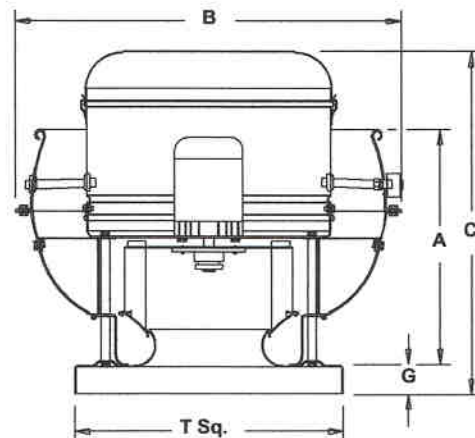
DATE: 02-06-2002

VCR-D

**Upblast Centrifugal
Exhaust Ventilator
Roof Mounted/Direct Drive**

STANDARD CONSTRUCTION FEATURES:

All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - One piece bottom spinning - Welded curb cap corners - Lifting Lugs - Permanently lubricated ball bearing motors - Corrosion resistant fasteners - Transit tested packaging.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Bhp (HP)
1	135V10D	800	.450	958	.096

Altitude (ft): 600 Temperature (F): 100

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure
1/6	1075	115/1/60	ODP

Dimensions (inches)

A	19-1/16
B	30-3/16
C	28-5/8
G	2
T Sq.	20
Roof Open. Sq.*	15-1/2
Unit Wt(lbs)***	105

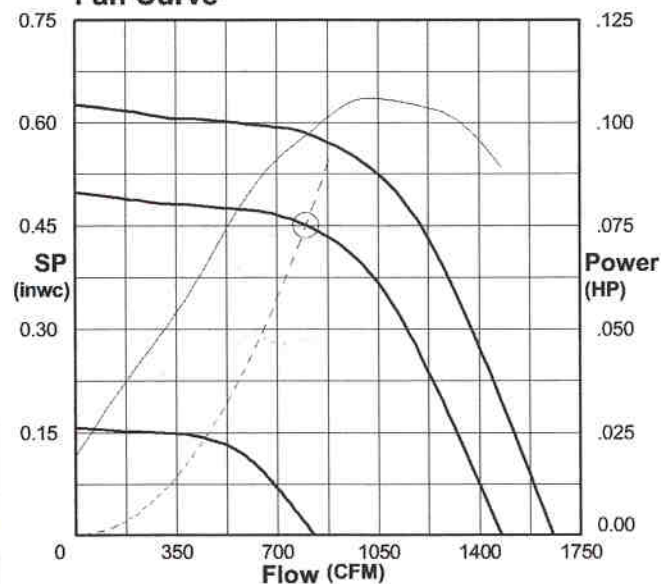
* Roof opening size for curbs supplied by Cook only.

***Includes fan, motor & accessories.

Accessories:

STD DISCONNECT NEMA 3
ROOF CURB RCG 18-13.5H -LESS NLR
UL762 (327Y-300DEG)
HINGED BASE KIT
FAN SPEED CONTROLLER 5 AMP 120 VOLT
778826 EXT BASE-18 GALV "

Fan Curve



Fan Curve Legend

CFM vs SP (958)	—
CFM vs HP	- - -
100% FSC (1075)	—
50% FSC (538)	—
System Curve	- - -
Point of Operation	○



COOK

PROJECT: Q135V10DR

DATE: 02-06-2002

RCG

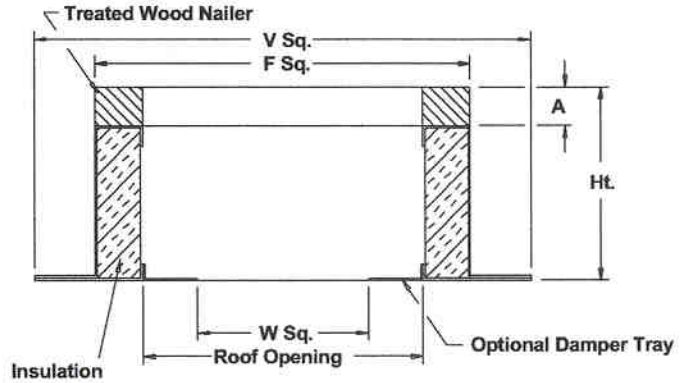
Galvanized Steel Roof Curb

STANDARD CONSTRUCTION FEATURES:

18 gauge galvanized steel - 1-1/2",
3 lbs. density thermal and accoustical
insulation - Continuously welded corners -
CCA pressure treated wood nailer.

Options:(As noted below*)

- 1) No wood nailer (deduct 1-1/2"
for actual height).
- 2) Damper tray.



Dimensions (inches)

Mark	Qty	Description	Ht	Options*	A	F Sq.	V Sq.	W Sq.	Roof Opening
STD ROOF TOP	1	RCG 18	13.5	1	1-1/2	18-1/2	22-1/2	11-3/4	15-1/2

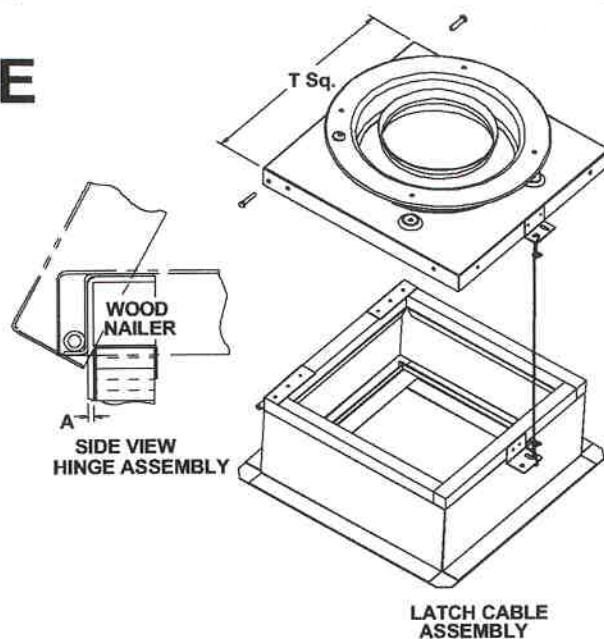


COOK

PROJECT: Q135V10DR

DATE: 02-06-2002

HINGED BASE Kit Assembly



Dimensions (inches)

Mark	Qty	Description	A Max	T Sq	Cable
STD ROOF TOP	1	HINGED BASE KIT	2-1/4	20	31



COOK

PROJECT: Q135V10DR

DATE: 02-06-2002

FSC

Fan Speed Controls

STANDARD CONSTRUCTION FEATURES:

PRODUCT DESCRIPTION - Through the "Quadrac" integrated semi-conductor device it is now possible to offer this system with many advantages. Fewer semi-conductor parts mean greater reliability and the passivation process used in the manufacture of the semi-conductor insures long life.

Printed circuit construction eliminates wiring difficulties and guarantees workmanship.

All of these factors serve to offer the most important of all features - quality.

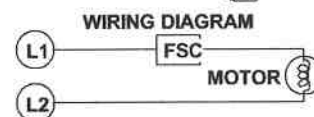
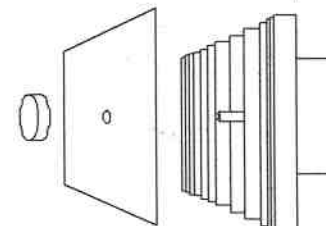
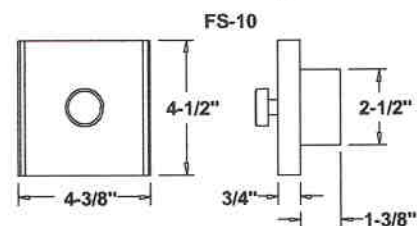
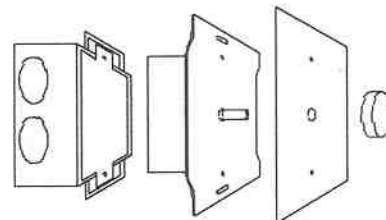
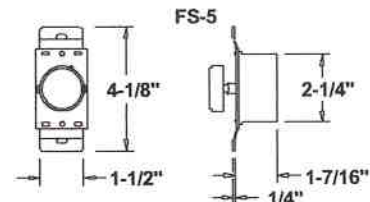
SPEED CONTROL - Positive Off/On action in the control dial. Speed range set to the customer's requirements. **CONTROL RATING** - 120 volts, 60 cycles, 1 phase. Maximum ambient temperature - 120 degree F (5 AMP, 10 AMP, 15 AMP). 220/240 volt, 50/60 cycles, 1 phase. Maximum ambient temperature - 120 degree F (5 AMP, 10 AMP). 220/240 volt model not UL listed. Fan cannot have UL listing if furnished with prewired 220/240 volt FSC. 277 volt, 60 cycles, 1 phase.

Maximum ambient temperature - 120 degree F (5 AMP). **WARNING** - Power must be turned off before installing this unit. **STANDARD INSTALLATION** - Fits any standard single gang box.

Turn off power and connect the two wires on the control to the two switch wires in the usual manner. The connection box is not supplied. **SPECIAL FEATURES** - Complete range control, solid state "Quadrac" integrated circuitry, solid state construction for long reliable operating life, saves on electric bills.

Dimensions (inches)

Mark	Qty	Description
STD ROOF TOP	1	FSC 5 AMP 120 VOLT





COOK VCR Installation Supplement

Centrifugal Roof and Wall Exhausters

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL

This publication contains supplemental installation procedures for standard units of the VCR - Centrifugal Roof and Wall Exhausters. Carefully read this publication prior to installation or maintenance procedure.

Loren Cook catalog, VCR, provides additional information describing the equipment, fan performance, available accessories and specification data.

For additional safety information, refer to AMCA publication 410-96, *Safety Practices for Users and Installers of Industrial and Commercial Fans*.

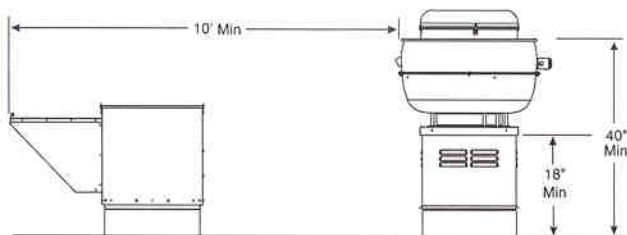
All of the publications listed above can be obtained from Loren Cook Company by phoning (417)869-6474, extension 166; by FAX at (417)832-9431; or by e-mail at info@lorencook.com.

For information and instructions on special equipment, contact Loren Cook Company at (417)869-6474.

Installation

1. VCR fans should be installed per NFPA 96 "Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations", and all local codes. Contact the local authority having jurisdiction if questions arise regarding codes affecting fan installation. *Additional guidance may be found in "Kitchen Ventilation Systems and Food Service Equipment Fabrication and Installation Guidelines" published by Sheet Metal and Air Conditioning Contractors' National Associations, Inc. (SMACNA).*

2. Ensure that the fan discharge is a minimum of 40 inches above the roof surface and a minimum of 10 feet from any adjoining structure or any air intakes. Small fans may require the use of a tall curb. (Figure 1)



(Figure 1)

3. Exhaust fans should be installed with flexible, weatherproof electrical cable, and hinged for access to the ductwork for cleaning and inspection. Installation of the Cook hinged base or hinge kit is recommended. (Figure 2)

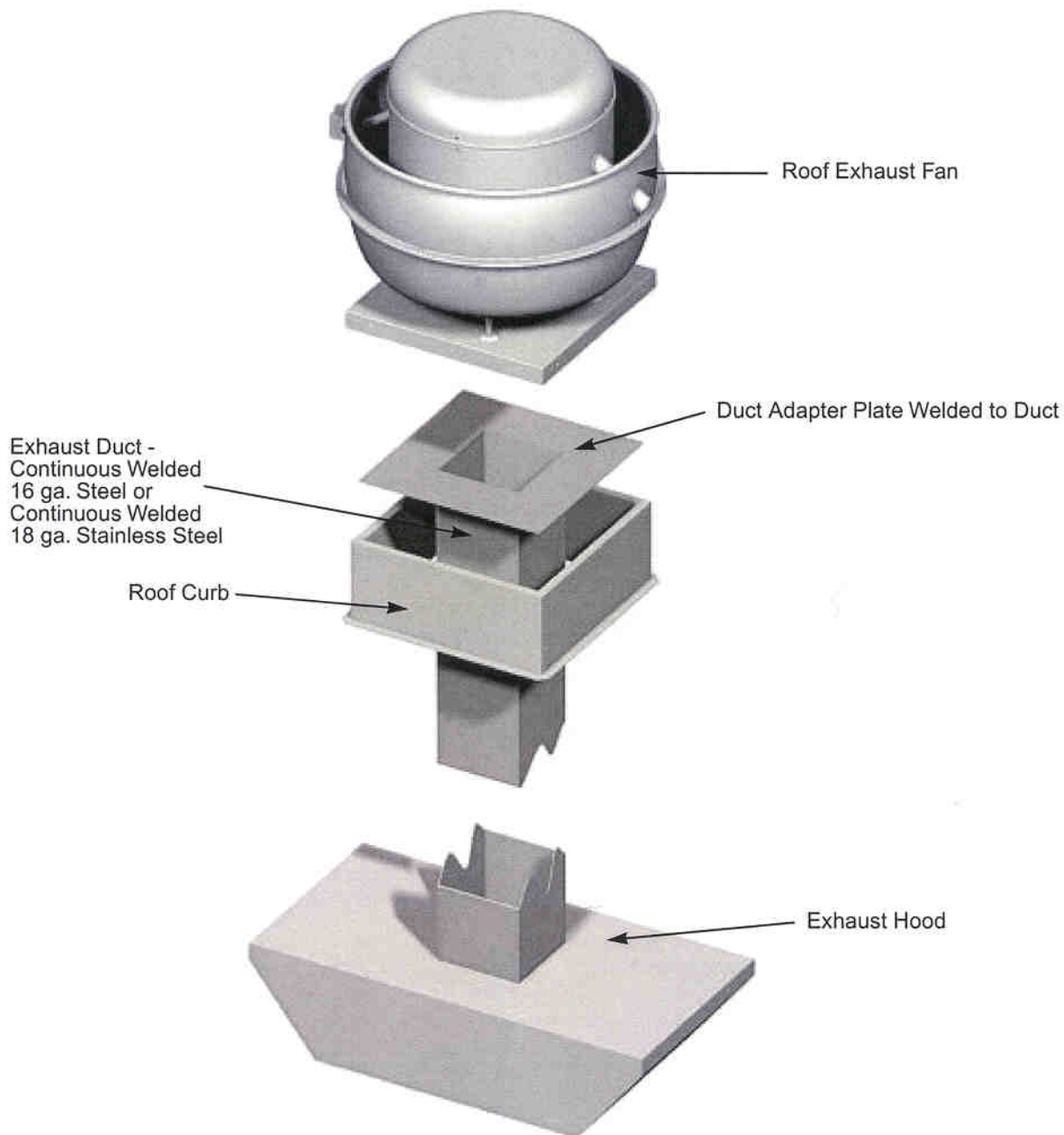


(Figure 2)

4. Welded ductwork should be terminated at the top of the curb with a welded duct adapter plate that positions the duct flush to the bottom of the fan directly below the fan inlet. (Figure 3 - on reverse side). To meet NFPA 96 requirements, duct must terminate no less than 18" from the surface of the roof. To assure against leakage, the base of the fan may be sealed to the adapter plate using silicone caulk designed for high temperature applications such as General Electric RTV 106 or equivalent. This seal should be renewed each time the fan is hinged for cleaning and inspection.

5. VCR fans installed on a side-wall should also be hinged for access to the ductwork for cleaning and inspection. Recommended installation is with hinge at the top and the fan provided with a secure prop to safely hold the fan open during cleaning and inspection.

6. If the fan is installed on a surface that is not level, install with the drain, grease tube, and grease trough at the lowest position.



(Figure 3)

Limited Warranty

Loren Cook Company warrants that your Loren Cook fan was manufactured free of defects in materials and workmanship, to the extent stated herein. For a period of one (1) year after date of shipment, we will replace any parts found to be defective without charge, except for shipping costs which will be paid by you. This warranty is granted only to the original purchaser placing the fan in service. This warranty is void if the fan or any part thereof has been altered or modified from its original design or has been abused, misused, damaged or is in worn condition or if the fan has been used other than for the uses described in the company manual. This warranty does not cover defects resulting from normal wear and tear. To make a warranty claim, notify Loren Cook Company, General Offices, 2015 East Dale Street, Springfield, Missouri 65803-4637, explaining in writing, in detail, your complaint and referring to the specific model and serial numbers of your fan. Upon receipt by Loren Cook Company of your written complaint, you will be notified, within thirty (30) days of our receipt of your complaint, in writing, as to the manner in which your claim will be handled. If you are entitled to warranty relief, a warranty adjustment will be completed within sixty (60) business days of the receipt of your written complaint by Loren Cook Company. This warranty gives only the original purchaser placing the fan in service specifically the right. You may have other legal rights which vary from state to state.

LOREN COOK COMPANY

Corporate Offices: 2015 E. Dale Street Springfield, MO 65803 417.869.6474
lorencook.com



INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS

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September 30, 2002

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Vice President,
Richard Cheeseman

Executive Director,
G.P. Russ Chaney

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Tel: 1-909-595-8449 Ext. 118
Fax: 1-909-594-5265

Standards
Tel: 1-909-595-8449 Ext. 123
Fax: 1-909-594-5265

Thomas Johnson
Johnson Diversified Prod Inc
1408 Northland Dr #407
Mendota Hts MN 55120-1013

Subject: Duct Velocity Requirements

Dear Thomas:

This is in response to your request for interpretation of the Uniform Mechanical Code regarding duct velocity requirements.

The 2002 UMC Interpretations Committee answered item UMC 02-16 below:

1. The 2000 UMC requires a type I hood for collecting and removing grease and smoke in commercial applications. (UMC 507.0) When there is empirical evidence that these factors are not present in the exhaust streams of commercial equipment, then a type II hood is indicated.
2. The presence or absence of grease or smoke in the exhaust stream of the equipment installed would determine the type of hood required.
3. The UMC is a minimum code standard. Any element of a mechanical system may be upgraded beyond code requirements. Future use is not a consideration in this code, unless it is part of the plans and specifications used to obtain the permit. Change of use may occur, but unless plans are produced and a permit issued the Administrative Authority would be held blameless in the event of misuse of existing equipment and facilities.

Considering this issue were Chairman, Roger Rotundo, City of Phoenix, AZ; Richard Butz, Summit County, Coalville, UT; William Daly, City of St. Paul, MN; Dennis King, City of San Francisco, CA; and Charlie Newcomer, City of Sheridan, WY; Clinton O. Stanford, City of Grand Prairie, TX. Thank you for your patience and interest.

Sincerely,

Roger Rotundo
Chairman, UMC Interpretations Committee
Ext. 138

*'Working in Concert with Government and Industry for Safe, Sanitary Plumbing and Mechanical Systems
Plumbing and Mechanical Codes for the Twenty-first Century.'*



Wells Manufacturing proudly supports CFESA
Commercial Food Equipment Service Association

SERVICE TRAINING - QUALITY SERVICE



CUSTOMER SATISFACTION

PREPARED FOR

Quizno's  **SUBS**

BY



WELLS

WELLS MANUFACTURING COMPANY
DIVISION OF CARRIER REFRIGERATION
2 ERIK CIRCLE, P. O. Box 280
Verdi, NV 89439
Customer Service (775) 345-0444 Ext.502
fax: (775) 345-0569
www.wellsbloomfield.com



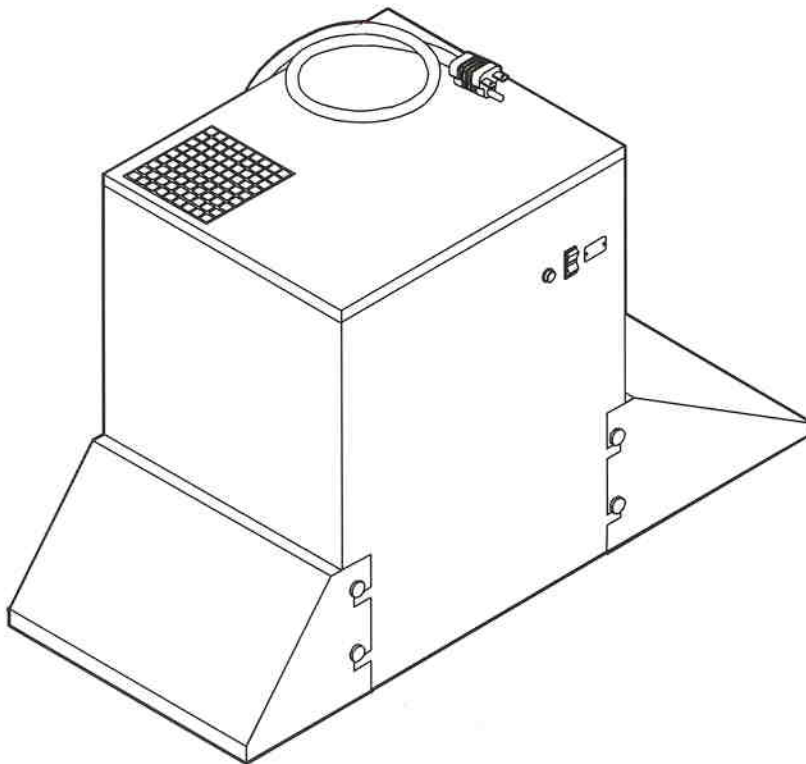
WELLS MANUFACTURING COMPANY
2 ERIK CIRCLE, P. O. Box 280
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fax: (775) 345-0569
www.wellsbloomfield.com

511

OWNERS MANUAL

MODEL WVSW VENTLESS HOOD

for
HOLMAN MM14
SANDWICH
WARMER



Includes
INSTALLATION
USE & CARE
SERVICE

Quizno's™  **SUBS**

IMPORTANT: DO NOT DISCARD THIS MANUAL

This manual is considered to be part of the appliance and is to be given to the OWNER or MANAGER of the restaurant, or to the person responsible for TRAINING OPERATORS of this appliance. Additional manuals are available from your WELLS DEALER.



THIS MANUAL MUST BE READ AND UNDERSTOOD BY ALL PERSONS USING OR INSTALLING THIS APPLIANCE. Contact your WELLS DEALER if you have any questions concerning installation, operation or maintenance of this equipment.

LIMITED WARRANTY STATEMENT

Unless otherwise specified, all commercial cooking equipment manufactured by WELLS MFG. CO. is warranted against defects in materials and workmanship for a period of one year from the date of original installation or 18 months from the date of shipment from our factory, whichever comes first, and is for the benefit of the original purchaser only.

THIS WARRANTY IS THE COMPLETE AND ONLY WARRANTY, EXPRESSED OR IMPLIED IN LAW OR IN FACT, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, AND/OR FOR DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH WELLS MFG. CO. PRODUCTS. This warranty is void if it is determined that, upon inspection by an authorized service agency, the equipment has been modified, misused, misapplied, improperly installed, or damaged in transit or by fire, flood or act of God. It also does not apply if the serial nameplate has been removed, or if service is performed by unau-

thorized personnel. The prices charged by Wells Mfg. Co. for its products are based upon the limitations in this warranty. Seller's obligation under this warranty is limited to the repair of defects without charge by a Wells Mfg. Co. factory authorized service agency or one of its sub-service agencies. This service will be provided on customer's premises for non-portable models. Portable models (a device with a cord and plug) must be taken or shipped to the closest authorized service agency, transportation charges prepaid, for service. In addition to restrictions contained in this warranty, specific limitations are shown in the Service Policy and Procedure Guide. Wells Mfg. Co. authorized service agencies are located in principal cities. This warranty is valid in the United States and Canada and void elsewhere. Please consult your classified telephone directory, your foodservice equipment dealer or write the Factory Service Department, Wells Manufacturing Company, P.O. Box 280, Verdi, Nevada 89439, phone (775) 345-0444 or (888) 492-2782, for information and other details concerning warranty.

SERVICE POLICY AND PROCEDURE GUIDE ADDITIONAL WARRANTY EXCLUSIONS

1. Resetting of safety thermostats, circuit breakers, over load protectors, and/or fuse replacements are **not** covered by this warranty unless warranted conditions are the cause.
2. All problems due to operation at **voltages or phase other than specified on equipment nameplates** are **not** covered by this warranty. Conversion to correct voltage and/or phase must be the customer's responsibility.
3. All problems due to **electrical connections not made in accordance with electrical code requirements and wiring diagrams** supplied with the equipment are **not** covered by this warranty.
4. Replacement of items **subject to normal wear**, to include such items as knobs, light bulbs; and, normal maintenance functions including adjustments of thermostats, adjustment of micro switches and replacement of fuses and indicating lights are **not** covered by warranty.
5. Damage to electrical cords and/or plug due to exposure to excessive heat are **not** covered by this warranty.
6. Full use, care, and maintenance instructions supplied with each machine. Noted maintenance and preventative maintenance items, such as servicing and cleaning schedules, are customer responsibility. Those miscellaneous adjustments noted are customer responsibility. Proper attention to preventative maintenance and scheduled maintenance procedures will prolong the life of the appliance.
7. Travel mileage is limited to **sixty (60) miles** from an Authorized Service Agency or one of its sub-service agencies.
8. All labor shall be performed during regular working hours. Overtime premium will be charged to the buyer.
9. All genuine Wells replacement parts are warranted for ninety (90) days from date of purchase on non-warranty equipment. This parts warranty is limited only to replacement of the defective part(s). **Any use of non-genuine Wells parts completely voids any warranty.**
10. Installation, labor, and job check-outs are **not** considered warranty and are thus **not** covered by this warranty.
11. Charges incurred by delays, waiting time or operating restrictions that hinder the service technician's ability to perform service are **not** covered by warranty. This includes institutional and correctional facilities.

SHIPPING DAMAGE CLAIM PROCEDURE

NOTE: For your protection, please note that equipment in this shipment was carefully inspected and packaged by skilled personnel before leaving the factory. Upon acceptance of this shipment, the transportation company assumes full responsibility for its safe delivery.

IF SHIPMENT ARRIVES DAMAGED:

1. **VISIBLE LOSS OR DAMAGE:** Be certain that any visible loss or damage is noted on the freight bill or express receipt, and that the note of loss or damage is signed by the delivery person.
2. **FILE CLAIM FOR DAMAGE IMMEDIATELY:** Regardless of the extent of the damage.

3. **CONCEALED LOSS OR DAMAGE:** if damage is unnoticed until the merchandise is unpacked, notify the transportation company or carrier immediately, and file "CONCEALED DAMAGE" claim with them. This should be done within fifteen (15) days from the date the delivery was made to you. Be sure to retain the container for inspection.

Wells Manufacturing cannot assume liability for damage or loss incurred in transit. We will, however, at your request, supply you with the necessary documents to support your claim.

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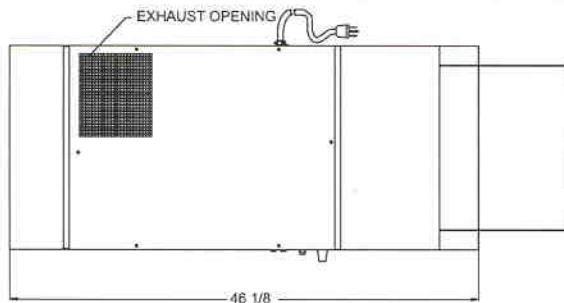
INTRODUCTION

Thank You for purchasing this Wells Manufacturing Co. appliance.

Proper installation, professional operation and consistent maintenance of this appliance will ensure that it gives you the very best performance and a long, economical service life.

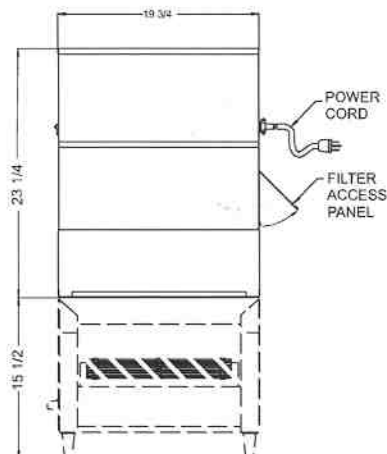
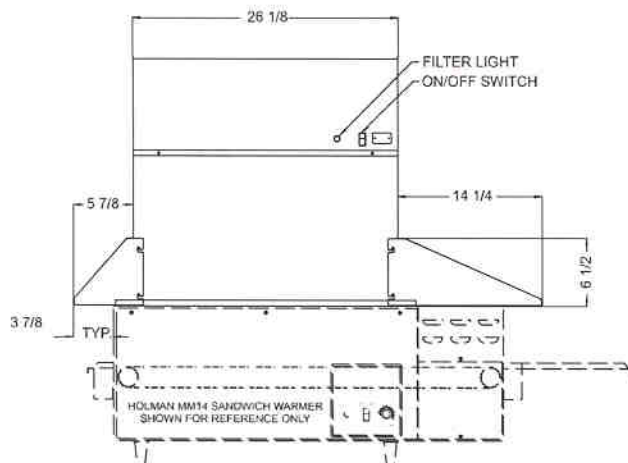
This manual contains the information needed to properly install this appliance, and to use and care for the appliance in a manner which will ensure its optimum performance.

SPECIFICATIONS



MODEL	VOLTS	AMPS
WWSW	208-240	1.3

INSTALLED WEIGHT OF HOOD		
92 lbs. (42.7 kg)		



FEATURES & OPERATING CONTROLS

WVSW VENTLESS HOOD

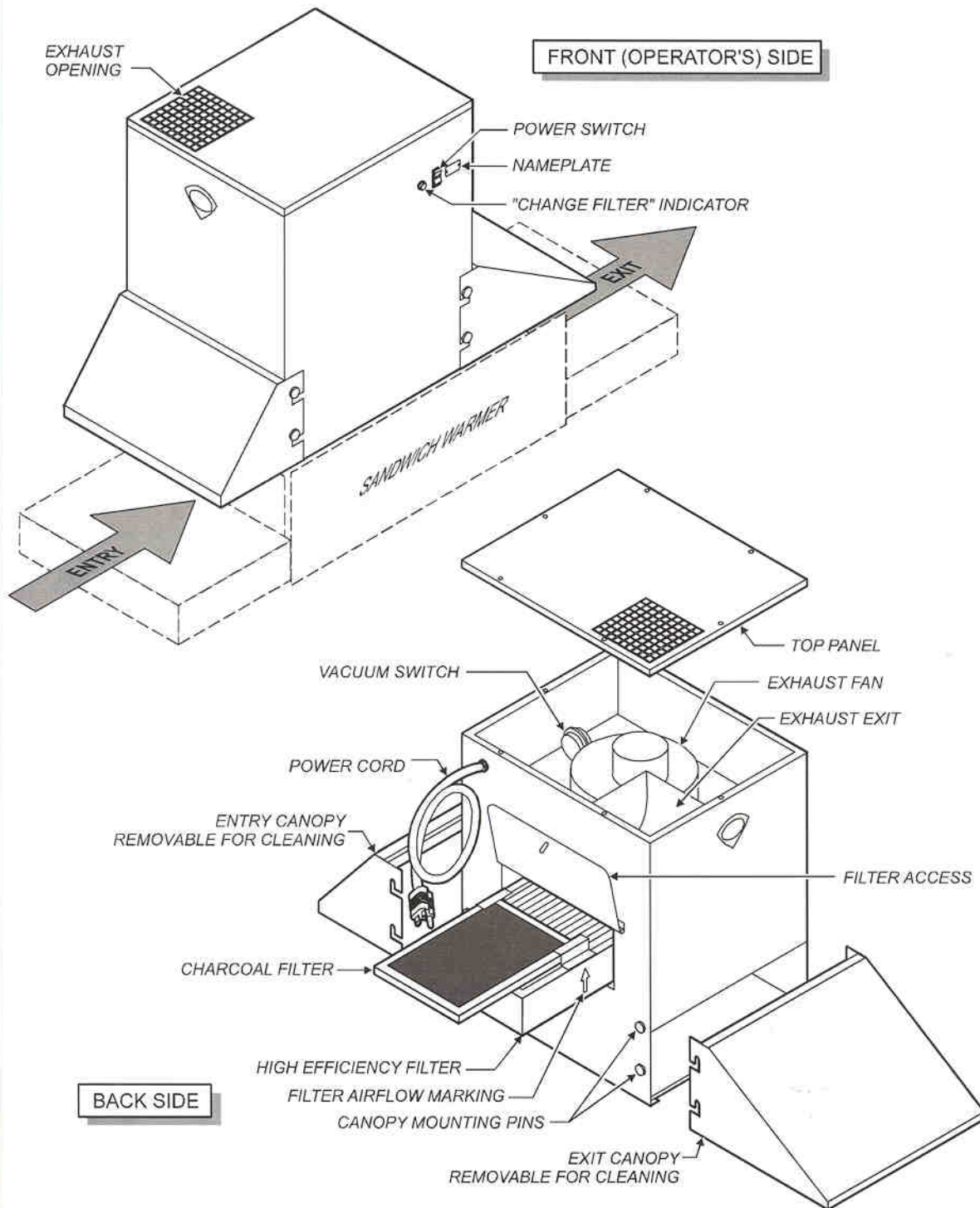



Fig. 1 Features & Operating Controls

FEATURES & OPERATING CONTROLS (continued)

ITEM	DESCRIPTION
CANOPY	Removable canopies aid in vapor capture at entry and exit of the sandwich warmer. Canopies hang from mounting pins at each end of the hood. Canopies may be mounted at either location. The longest canopy must mount at the warmer exit.
ELECTRICAL	The hood plugs into a NEMA 6-15R receptacle with a 6' power cord. An illuminated power switch on the front panel is used to start/stop the hood fan.
EXHAUST	The hood uses an exhaust fan to provide air movement. The fan exhausts through a screened opening in the top of the hood. IMPORTANT: DO NOT block exhaust opening.
FILTERS	The hood uses two filters. A high efficiency filter is used to capture particulate emissions (smokes, mists and vapors). A charcoal filter is used to help control odors. Filters are accessed by opening a hinged panel on the back side of the hood. Filter operation is monitored by a vacuum switch. When the filter(s) become loaded to the point of being unable to remove particulates, a front panel "change filters" indicator will glow.
NAMEPLATE	Provides Manufacturer, Model and Serial Number information. Also, provides electrical ratings.
TOP PANEL	<div style="display: flex; align-items: center;">  <div> <p>CAUTION! Electric Shock Hazard Exposed Electric Circuits Top panel must be opened ONLY by qualified personnel. Allows access to interior components. DO NOT stack anything on top of the hood.</p> </div> </div>

AGENCY LISTING INFORMATION

This appliance conforms to NSF Standard 4 for sanitation only if installed and maintained according to the instructions in this manual.

This appliance is  Listed for 208V and 240V.

This appliance is  Listed for 208V and 240V.

This appliance meets applicable requirements of §27-131 of the New York City Building Code (M.E.A.)

NOTE: This ductless hood has not been evaluated to the requirements of NFPA 96.



STD 4



PRECAUTIONS AND GENERAL INFORMATION



WARNING: **Electric** **Shock hazard**

All servicing requiring access to non-insulated electrical components must be performed by a factory authorized technician.

DO NOT open or remove the top panel. Failure to follow this warning can result in severe electrical shock.



CAUTION: **Risk of** **Damage**

DO NOT connect or energize this appliance until all installation instructions are read and followed. Damage to the appliance will result if these instructions are not followed.



CAUTION: **Hot Surface**

Exposed surfaces can be hot to the touch and may cause burns.

This appliance is intended for use in commercial establishments only.

This appliance is intended as a smoke and odor control device, designed for use with specified cooking equipment (specifically: Holman MM14 Sandwich Warmer). No other use is recommended or authorized by the manufacturer or its agents.

Operators of this appliance must be familiar with the appliance use, limitations and associated restrictions. Operating instructions must be read and understood by all persons using or installing this appliance.

Cleanliness of this appliance is essential to good sanitation. Read and follow all included cleaning instructions and schedules to ensure the safety of the food product.

Disconnect this appliance from electrical power before performing any maintenance or servicing.

DO NOT submerge this appliance in water. This appliance is not jet stream approved. Do not direct water jet or steam jet at this appliance, or at any control panel or wiring. Do not splash or pour water on, in or over any controls, control panel or wiring. Do not wash floor around this appliance with water or steam jet.

Exposed surfaces of this appliance can be hot to the touch and may cause burns.

The technical content of this manual, including any wiring diagrams, schematics, parts breakdown illustrations and/or adjustment procedures, is intended for use by qualified technical personnel.

Any procedure which requires the use of tools must be performed by a qualified technician.

This manual is considered to be a permanent part of the appliance. This manual and all supplied instructions, diagrams, schematics, parts breakdown illustrations, notices and labels must remain with the appliance if it is sold or moved to another location.

This appliance is made in the USA. Unless otherwise noted, this appliance has American sizes on all hardware.

INSTALLATION

UNPACKING & INSPECTION

Carefully read all instructions in this manual before starting any installation.

Carefully remove the hood from the carton.

IMPORTANT: Appliance weighs 92 lbs. Use appropriate care when removing from carton and installing on sandwich warmer.

Remove all protective plastic film, packing materials and accessories from the hood before connecting electrical power or otherwise performing any installation procedure.

Read and understand all labels and diagrams attached to the hood.

Carefully account for all components and accessories before discarding packing materials. Store all accessories in a convenient place for later use.

COMPONENTS:

ENTRY CANOPY
EXIT CANOPY
HIGH EFFICIENCY FILTER
CHARCOAL FILTER

SETUP

Carefully place hood on top of Holman MM14 Sandwich Warmer. Orient hood so that power switch is on the same side as the power switch of the warmer. Center hood over the body of the warmer as shown in Fig. 2 below:

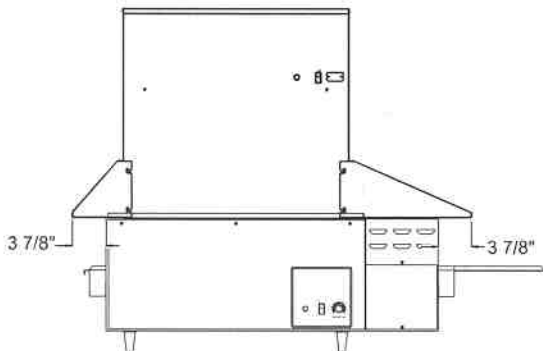


Fig. 2 Hood installation on warmer

Check high efficiency filter and charcoal filter for proper installation. Charcoal filter slides into clips on the high efficiency filter. Airflow marks must point "up".

Attach entry and exit canopies to pins on sides of hood. Canopies are interchangeable and may be mounted at either end, depending on the direction of product flow. The short canopy is the ENTRY canopy, and the long canopy is the EXIT canopy.

Maintain required clearances of at least 6" between the appliance and adjacent combustible surfaces.

NOTE: DO NOT discard the carton or other packing materials until you have inspected the hood for hidden damage and tested it for proper operation. Refer to *SHIPPING DAMAGE CLAIM PROCEDURE* on the inside front cover of this manual.



WARNING! Risk of Personal Injury

Installation procedures must be performed by a qualified technician with full knowledge of all applicable electrical codes. Failure can result in personal injury and property damage.



CAUTION! Risk of Personal Injury and Property Damage

Unplug sandwich warmer and allow to cool before beginning installation.

IMPORTANT:

Maintain required clearances of at least 6" between the appliance and adjacent combustible surfaces.

Avoid storing flammable or combustible materials in, on or near the appliance.

INSTALLATION (continued)



WARNING! Electric Shock hazard

All servicing requiring access to non-insulated electrical components must be performed by a factory authorized technician.

DO NOT open any access panel which requires the use of tools. Failure to follow this warning can result in severe electrical shock.



CAUTION! Electrical Shock Hazard

The ground prong of the power cord is part of a system designed to protect you against electric shock in the event of internal damage. DO NOT cut the ground prong (large round prong) or twist a blade to make the plug fit an existing receptacle.

IMPORTANT:

Contact a licensed electrician to install and connect electrical power to the appliance.

IMPORTANT:

Damage due to being connected to the wrong voltage or phase is NOT covered by warranty.

ELECTRICAL INSTALLATION

Refer to the nameplate. Verify the electrical power source. Voltage and phase must match the nameplate specifications. Plugging the hood into the wrong voltage can severely damage the unit.

Your hood is equipped with a grounded electrical cord. This cord must be plugged into a properly grounded NEMA 6-15R 208 volt or 240 volt, 60 Hz., single phase receptacle.

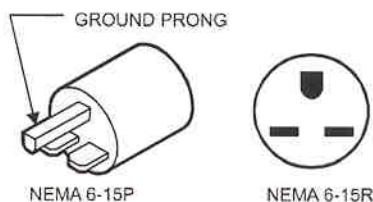


Fig. 3 Electrical Plug and Receptacle Configuration

OPERATING CONTROLS

Controls include a lighted POWER SWITCH and an amber REPLACE FILTER indicator light.

Press POWER SWITCH to ON anytime sandwich warmer is operating.

When power is first turned on, the REPLACE FILTER light will glow. As the fan comes up to speed and air flow is established, the REPLACE FILTER light will go out.

If the REPLACE FILTER light does not go out, the filters must be replaced. However, the fan will continue to operate when the REPLACE FILTER light is lit.



Fig. 4 Operating Controls

FILTER REMOVAL AND INSTALLATION

Disconnect power from hood and sandwich warmer before servicing filters.

Remove screw from filter access panel on back of hood. Slide filter pack (high efficiency filter and charcoal filter) from filter chamber.

Slide new filter pack into filter chamber. Be sure airflow markings on both filters point "up".

Close access panel and reinstall screw.

IMPORTANT:

Filters are disposable. Never attempt to wash either filter. Filters will absorb water if washed, causing food contamination and possible equipment damage.



CAUTION!
Personal Injury
Hazard

Disconnect power from hood and sandwich warmer before servicing filters.

IMPORTANT:

DO NOT store anything on top of the hood.

DO NOT block the exhaust opening.

IMPORTANT:

Both the high efficiency and charcoal filters must be in place at all times during operation.

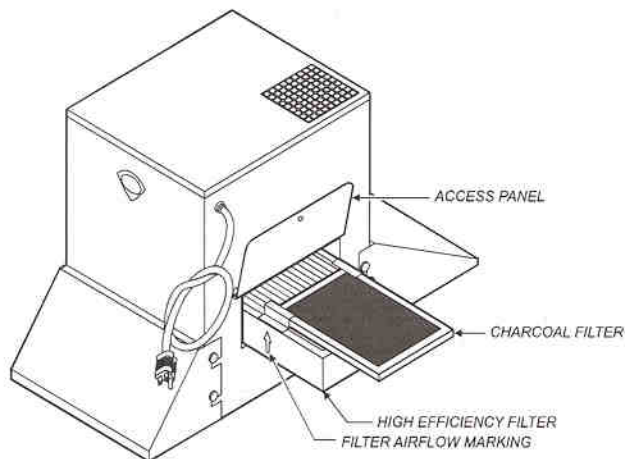


Fig. 5 Filter Installation

CLEANING INSTRUCTIONS



CAUTION! Personal Injury Hazard

Disconnect power from hood and sandwich warmer before cleaning.

IMPORTANT: DO NOT spill or pour water into controls, control panel or wiring.

DO NOT spill or pour water into exhaust opening.

DO NOT submerge hood in water. Damage to internal components will occur. Damage to internal components from water damage is **not** covered by warranty.

PREPARATION

Unplug hood and sandwich warmer
Allow to cool completely before cleaning

FREQUENCY

Daily

TOOLS

Mild Detergent
Soft Cloth or Sponge

1. Disconnect power from hood and sandwich warmer before cleaning.
2. Remove entry and exit canopies. Canopies may be washed in a sink or dishwasher. Rinse and dry canopies thoroughly.
3. Wipe interior and exterior surfaces of hood with a soft cloth or sponge dampened with water and a mild detergent.

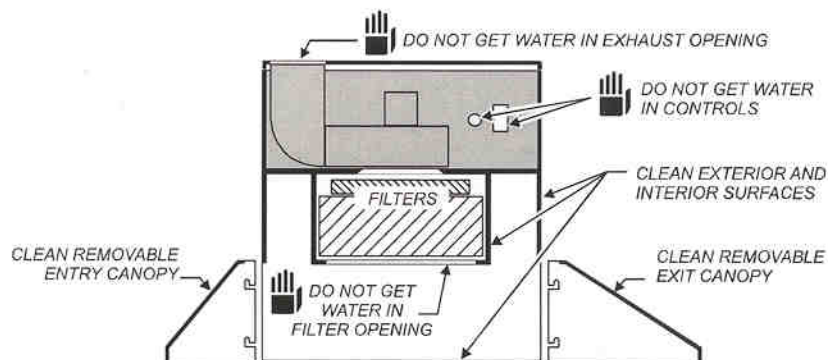
IMPORTANT:

Never attempt to wash either filter.

Filters will absorb water if washed, causing food contamination and possible equipment damage.

4. Rinse all washed areas by wiping with a clean soft cloth dampened with clean water. Dry with a soft cloth.
5. Reinstall entry and exit canopies. The entry canopy is the shorter of the two canopies.

Procedure is complete



TROUBLESHOOTING SUGGESTIONS

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
No operation, no lights	Cord unplugged	Plug cord into appropriate power receptacle.
	Circuit breaker off or tripped	Reset circuit breaker
	Damaged power cord or plug	Replace power cord
	Damaged power switch	Replace power switch
REPLACE FILTER light remains lit (never shuts off)	Filters dirty	Replace filters
If filters are clean and fan is operating	New filter still in plastic wrapper	Remove plastic wrapper
	Exhaust opening blocked	Clear or clean exhaust duct and opening
	Filter opening blocked	Clear filter opening
	Vacuum hose kinked	Unkink vacuum hose
	Vacuum line plugged	Clean or replace vacuum line
	Damaged vacuum switch	Replace vacuum switch
If fan is not operating	Fan jammed	Unjam fan
	Damaged motor start capacitor	Replace start capacitor
	Damaged fan motor	Replace fan motor

SERVICE INSTRUCTIONS

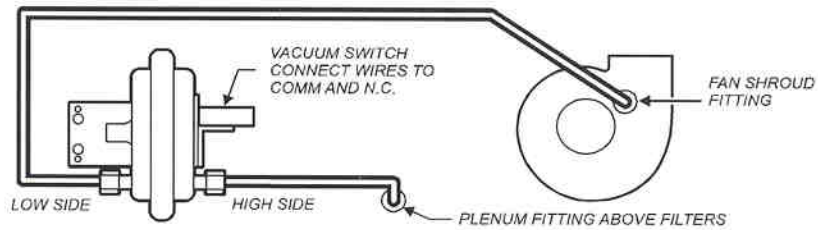
IMPORTANT:

DO NOT store anything on top of the hood.

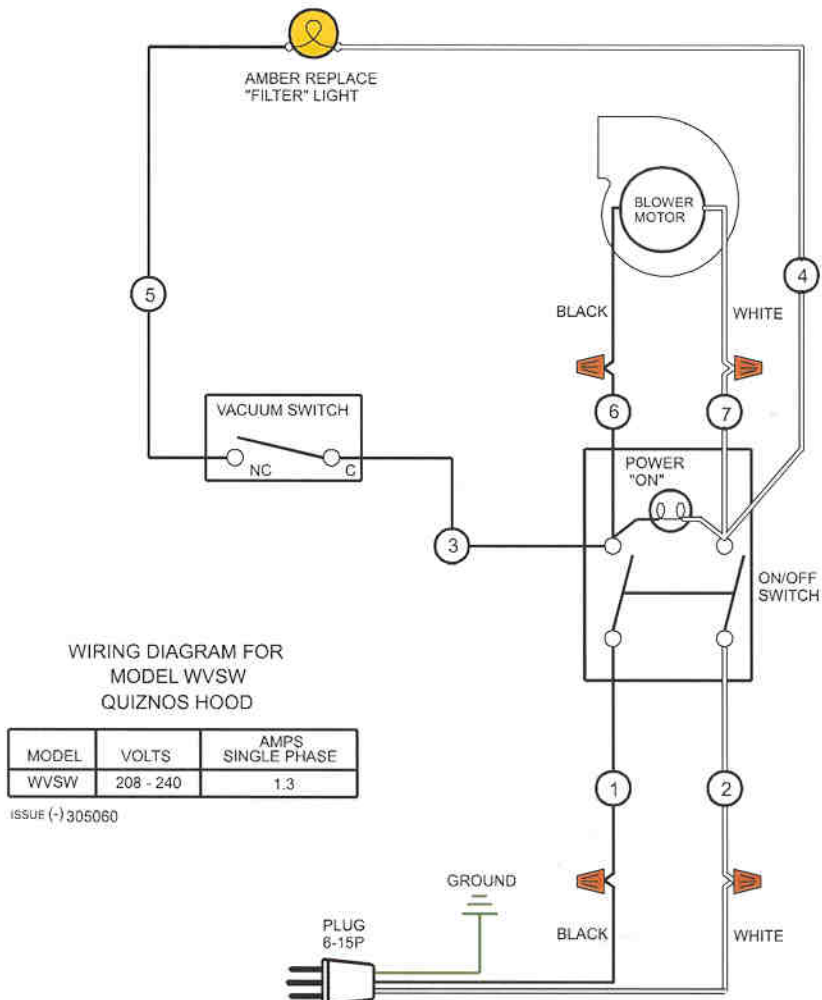
DO NOT block the exhaust opening.

Filter operation is monitored by a vacuum switch and a system of vacuum hoses. The switch energizes the REPLACE FILTER light if airflow through the filters is insufficient for efficient operation. The light is a warning only, and does not control the operation of the hood.

VACUUM DIAGRAM



WIRING DIAGRAM



PARTS & SERVICE

DESCRIPTION

PART NO.

HIGH EFFICIENCY FILTER 16 x 20x 4

22862

CHARCOAL (CARBON) FILTER 14 x 20 x 7/8

22403

IMPORTANT: Use only factory authorized service parts and replacement filters.

For factory authorized service, or to order factory authorized replacement parts, contact your Wells authorized service agency, or call:

Wells Manufacturing Co.
2 Erik Circle
P. O. Box 280
Verdi, NV 89439
phone: (775) 345-0444
fax: (888) 492-2783
(Service Parts Dept.)

Service Parts Department can supply you with the name and telephone number of the WELLS AUTHORIZED SERVICE AGENCY nearest you.

CUSTOMER SERVICE DATA

please have this information available if calling for service

RESTAURANT _____ LOCATION _____
INSTALLATION DATE _____ TECHNICIAN _____
SERVICE COMPANY _____
ADDRESS _____ STATE _____ ZIP _____
TELEPHONE NUMBER (____) _____ - _____

EQUIPMENT MODEL NO. _____
EQUIPMENT SERIAL NO. _____

VOLTAGE: (check one) ☐ 208 ☐ 240

AIR FILTER TESTING LABORATORIES,

4632 OLD LA GRANGE ROAD | CRESTWOOD, KENTUCKY 40014

PHONE | FAX (502)222-5720

REPORT NO. **9478**

SHEET NO. **1**

HOLMAN COOKING EQUIPMENT - OVEN WITH CONVEYOR
MODEL 318 HX -SERIAL NO. 17047003-0496

TESTS ON HOLMAN COOKING OVEN WITH CONVEYOR USING EPA 202 METHOD SAMPLING THE EMISSIONS OF FATS AND GREASES, AND USING AFS3 MEDIA TO CAPTURE TOTAL EMISSIONS OF GREASE AND FATS FROM PIZZA'S WERE COOKED AT TOP & BOTTOM TEMPERATURES AT 425 DEG. F

EPA METHOD 202 IS A TECHNIQUE FOR SAMPLING A SMALL PART OF OF THE TOTAL EXHAUST AIR. IT CONSISTS OF A PARTICULATE FILTER HOLDER, 4 IMPINGER BOTTLES IN SERIES, THE FIRST TWO CONTAIN 100 ml OF DISTILLED WATER, THE THIRD IS EMPTY (TO CATCH ANY OVERFLOW), AND THE FOURTH CONTAINS SILICA-GEL, A SUBSTANCE USED TO ABSORB MOISTURE FROM THE GAS STREAM.

THE BOTTLES ARE PLACED IN AN INSULATED CONTAINER PACKED WITH ICE. THE PROBE, BOTTLES, AIR FLOW METER, GAS METER ARE CONNECTED TO A VACUUM PUMP. THE SAMPLING RATE IS ABOUT 1 CFM PER MINUTE.

SAMPLE	INITIAL WT.	FINAL WT.	GAIN	TOTAL gms	AS mgrs
1	51.15	51.3	0.15	0.21	210
2	51.57	51.63	0.06		
AFS 3 MEDIA TEST					

RH = 87.7% DENSITY = 0.0717 LB / FT ^3

ACFM	TEMP F.	SCFM	SAMPLE TIME	TOTAL CUBIC FT.	AS CUBIC M	CONC. mgrs/m^3
500	78	493	60	29554	837	0.251

ALLOWABLE CONCENTRATION IS 5.0 MILLIGRAMS PER CUBIC METER.

TEST SUPERVISOR

RJB,RS,WTS

DATE

7-23-1996

ENGINEERING APPROVAL

David J. Murphy Jr.

APPROVAL



AIR FILTER TESTING LABORATORIES,

4632 OLD LA GRANGE ROAD | CRESTWOOD, KENTUCKY 40014

PHONE | FAX (502)222-5720

REPORT NO. 9478

SHEET NO 2

HOLMAN CONVEYOR OVEN MODEL 318 HX SERIAL NO. 170447003-0496

TEST ON HOLMAN OVEN WITH CONVEYOR USING EPA METHOD 202 FOR SAMPLING THE EMISSIONS OF FATS AND GREASES, AND USING AFS3 MEDIA TO CAPTURE TOTAL EMISSIONS OF GREASE AND FATS FROM THE PROCESS OF COOKING PIZZA'S

QUANTITY OF PIZZA'S COOKED

THE COOKING TEMPERATURE WAS SET FOR TOP & BOTTOM HEAT AT 425 DEG. F
THE CONVEYOR SPEED WAS SET - AT 10

AFTL FABRICATED A TEST HOOD. THE CONVEYOR OVEN WAS ON A TABLE INSIDE OF THE HOOD.

THE OVEN WAS PRE-HEATED TO 325 DEG. F

THE HOOD WAS CONNECTED TO A TEST PLENUM AND 500 CFM OF AIR WAS EXHAUSTED THROUGH THE TEST SET-UP

WITHIN THE TEST DUCT 2 LAYERS OF ASHRAE 95% MEDIA WAS PLACED IN SERIES TO CAPTURE ANY PARTICULATE MATTER BEING GENERATED DURING THE TEST. THE TWO LAYERS OF MEDIA WERE WEIGHED BEFORE AND AFTER THE TEST.

UPSTREAM OF THE MEDIA A PROBE WAS INSERTED TO SAMPLE THE EXHAUST AIR STREAM IN ACCORDANCE WITH EPA METHOD 202

EPA METHOD 202 IS A TECHNIQUE FOR SAMPLING A SMALL PART OF OF THE TOTAL EXHAUST AIR. IT CONSISTS OF A PARTICULATE FILTER HOLDER, 4 IMPINGER BOTTLES IN SERIES, THE FIRST TWO CONTAIN 100 ml OF DISTILLED WATER, THE THIRD IS EMPTY (TO CATCH ANY OVERFLOW), AND THE FOURTH CONTAINS SILICA GEL, A SUBSTANCE USED TO ABSORB MOISTURE FROM THE GAS STREAM. THE BOTTLES ARE PLACED INTO AN INSULATED CONTAINER PACKED WITH ICE. THE PROBE, BOTTLES, AIRFLOW METER, GAS METER ARE CONNECTED TO A VACUUM PUMP. THE SAMPLING RATE IS ABOUT 1 CFM. AFTER THE TEST IS COMPLETED THE WATER IS MEASURED AND MIXED WITH METHYLENE CHLORIDE, PLACED IN A SEPARATORY FUNNEL, VIGOROUSLY SHAKEN, THEN ALLOWED TO SEPARATE THE MC FROM THE WATER. THE MC IS EVAPORATED TO DRYNESS.

EPA METHOD 202			PARTICULATE FILTER RESULTS			
METER INITIAL	METER FINAL	ACF	TEMP	PRESSURE IN. Hg	SCF	CUBIC METERS
876.2	949.47	73.27	78	3	64.94	1.84

INITIAL WEIGHT	FINAL WEIGHT	GAIN GRAMS	AS mgs.	CONC. mgs/m ³
1.00411	1.0046	0.00049	0.49	0.266

METHYLENE CHLORIDE EXTRACTION METHOD - NO GREASES DETECTED
ALLOWABLE CONCENTRATION IS 5.0 MILLIGRAMS PER CUBIC METER.

AIR FILTER TESTING LABORATORIES, INC.

4632 OLD LA GRANGE ROAD | CRESTWOOD, KENTUCKY 40014

PHONE | FAX (502)222-5720

REPORT NO. **9305**

SHEET NO. **1**

HOLMAN COOKING EQUIPMENT - OVEN WITH CONVEYOR
MODEL 418 HX -SERIAL NO. 17230001-0496

TESTS ON HOLMAN COOKING OVEN WITH CONVEYOR USING EPA 202 METHOD SAMPLING THE EMISSIONS OF FATS AND GREASES, AND USING AFS3 MEDIA TO CAPTURE TOTAL EMISSIONS OF GREASE AND FATS FROM PIZZA'S WERE COOKED AT TOP & BOTTOM TEMPERATURES AT 425 DEG. F

EPA METHOD 202 IS A TECHNIQUE FOR SAMPLING A SMALL PART OF OF THE TOTAL EXHAUST AIR. IT CONSISTS OF A PARTICULATE FILTER HOLDER, 4 IMPINGER BOTTLES IN SERIES, THE FIRST TWO CONTAIN 100 ml OF DISTILLED WATER, THE THIRD IS EMPTY (TO CATCH ANY OVERFLOW), AND THE FOURTH CONTAINS SILICA-GEL, A SUBSTANCE USED TO ABSORB MOISTURE FROM THE GAS STREAM. THE BOTTLES ARE PLACED IN AN INSULATED CONTAINER PACKED WITH ICE. THE PROBE, BOTTLES, AIR FLOW METER, GAS METER ARE CONNECTED TO A VACUUM PUMP. THE SAMPLING RATE IS ABOUT 1 CFM PER MINUTE.

SAMPLE	INITIAL WT.	FINAL WT.	GAIN	TOTAL gms	AS mgrs..
1	50.34	50.53	0.19	0.27	270
2	50.72	50.80	0.08		
AFS 3 MEDIA TEST					

RH = 67.7% DENSITY = 0.0717 LB / FT ^3

ACFM	TEMP F.	SCFM	SAMPLE TIME	TOTAL CUBIC FT.	AS CUBIC M	CONC. mgrs/m^3
500	71.4	522	64	33428	947	0.285

ALLOWABLE CONCENTRATION IS 5.0 MILLIGRAMS PER CUBIC METER.

TEST SUPERVISOR

R.J.B.

DATE

5-09-1996

ENGINEERING APPROVAL

David J. Murphy Jr.

APPROVAL



AIR FILTER TESTING LABORATORIES, INC.

4632 OLD LA GRANGE ROAD | CRESTWOOD, KENTUCKY 40014

PHONE | FAX (502)222-5720

REPORT NO. 9305

SHEET NO 2

HOLMAN CONVEYOR OVEN MODEL 418HX SERIAL NO. 17230001-0496

TEST ON HOLMAN OVEN WITH CONVEYOR USING EPA METHOD 202 FOR SAMPLING THE EMISSIONS OF FATS AND GREASES, AND USING AFS3 MEDIA TO CAPTURE TOTAL EMISSIONS OF GREASE AND FATS FROM THE PROCESS OF COOKING PIZZA'S

QUANTITY OF PIZZA'S COOKED

THE COOKING TEMPERATURE WAS SET FOR TOP & BOTTOM HEAT AT 425 DEG. F
THE CONVEYOR SPEED WAS SET - AT 10

AFTL FABRICATED A TEST HOOD. THE CONVEYOR OVEN WAS ON A TABLE INSIDE OF THE HOOD.

THE OVEN WAS PRE-HEATED TO 325 DEG. F

THE HOOD WAS CONNECTED TO A TEST PLENUM AND 500 CFM OF AIR WAS EXHAUSTED THROUGH THE TEST SET-UP

WITHIN THE TEST DUCT 2 LAYERS OF ASHRAE 95% MEDIA WAS PLACED IN SERIES TO CAPTURE ANY PARTICULATE MATTER BEING GENERATED DURING THE TEST. THE THREE LAYERS OF MEDIA WERE WEIGHED BEFORE AND AFTER THE TEST.

UPSTREAM OF THE MEDIA A PROBE WAS INSERTED TO SAMPLE THE EXHAUST AIR STREAM IN ACCORDANCE WITH EPA METHOD #5.

EPA METHOD 202 IS A TECHNIQUE FOR SAMPLING A SMALL PART OF OF THE TOTAL EXHAUST AIR. IT CONSISTS OF A PARTICULATE FILTER HOLDER, 4 IMPINGER BOTTLES IN SERIES, THE FIRST TWO CONTAIN 100 ml OF DISTILLED WATER, THE THIRD IS EMPTY (TO CATCH ANY OVERFLOW), AND THE FOURTH CONTAINS SILICA GEL, A SUBSTANCE USED TO ABSORB MOISTURE FROM THE GAS STREAM. THE BOTTLES ARE PLACED INTO AN INSULATED CONTAINER PACKED WITH ICE. THE PROBE, BOTTLES, AIRFLOW METER, GAS METER ARE CONNECTED TO A VACUUM PUMP. THE SAMPLING RATE IS ABOUT 1 CFM. AFTER THE TEST IS COMPLETED THE WATER IS MEASURED AND MIXED WITH METHYLENE CHLORIDE, PLACED IN A SEPARATORY FUNNEL, VIGOROUSLY SHAKEN, THEN ALLOWED TO SEPARATE THE MC FROM THE WATER. THE MC IS EVAPORATED TO DRYNESS.

EPA METHOD 202 PARTICULATE FILTER RESULTS						
METER INITIAL	METER FINAL	ACFM	TEMP	PRESSURE IN. Hg	SCFM	CUBIC METERS
623.03	699.00	75.97	70	6	59.83	1.69

INITIAL WEIGHT	FINAL WEIGHT	GAIN GRAMS	AS mgs.	CONC. mgs/m ³
0.93616	0.9367	0.00054	0.54	0.319

METHYLENE CHLORIDE EXTRACTION METHOD - NO GREASES DETECTED
ALLOWABLE CONCENTRATION IS 5.0 MILLIGRAMS PER CUBIC METER.

AIR FILTER TESTING LABORATORIES, INC.

4632 OLD LA GRANGE ROAD | CRESTWOOD, KENTUCKY 40014

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REPORT NO. 9479

SHEET NO. 1

HOLMAN COOKING EQUIPMENT - OVEN WITH CONVEYOR
MODEL 314 HX -SERIAL NO. 17047003-0496

TESTS ON HOLMAN COOKING OVEN WITH CONVEYOR USING EPA 202 METHOD
 SAMPLING THE EMISSIONS OF FATS AND GREASES, AND USING AFS3
 MEDIA TO CAPTURE TOTAL EMISSIONS OF GREASE AND FATS FROM
 PIZZA'S WERE COOKED AT TOP & BOTTOM TEMPERATURES AT 425 DEG. F

EPA METHOD 202 IS A TECHNIQUE FOR SAMPLING A SMALL PART OF OF THE
 TOTAL EXHAUST AIR. IT CONSISTS OF A PARTICULATE FILTER HOLDER,
 4 IMPINGER BOTTLES IN SERIES, THE FIRST TWO CONTAIN 100 ml OF
 DISTILLED WATER, THE THIRD IS EMPTY (TO CATCH ANY OVERFLOW),
 AND THE FOURTH CONTAINS SILICA-GEL, A SUBSTANCE USED TO ABSORB
 MOISTURE FROM THE GAS STREAM.

THE BOTTLES ARE PLACED IN AN INSULATED CONTAINER PACKED WITH ICE.
 THE PROBE, BOTTLES, AIR FLOW METER, GAS METER ARE CONNECTED
 TO A VACUUM PUMP. THE SAMPLING RATE IS ABOUT 1 CFM PER MINUTE.

SAMPLE	INITIAL WT.	FINAL WT.	GAIN	TOTAL gms	AS mgrs
1	51.3	51.54	0.24	0.25	250
2	51.52	51.53	0.01		
AFS 3 MEDIA TEST					

ACFM	TEMP F.	SCFM	SAMPLE TIME	TOTAL CUBIC FT.	AS CUBIC M	CONC. mgrs/m ³
500	82	489	90	44004	1246	0.201

ALLOWABLE CONCENTRATION IS 5.0 MILLIGRAMS PER CUBIC METER.

TEST SUPERVISOR

RJB,RS

DATE

7-25-1996

ENGINEERING APPROVAL

David J. Murphy Jr.

APPROVAL



AIR FILTER TESTING LABORATORIES, INC.

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REPORT NO. 9479

SHEET NO 2

HOLMAN CONVEYOR OVEN MODEL 314 HX SERIAL NO. 170447003-0496

TEST ON HOLMAN OVEN WITH CONVEYOR USING EPA METHOD 202 FOR SAMPLING THE EMISSIONS OF FATS AND GREASES, AND USING AFS3 MEDIA TO CAPTURE TOTAL EMISSIONS OF GREASE AND FATS FROM THE PROCESS OF COOKING PIZZA'S

QUANTITY OF PIZZA'S COOKED | 10

THE COOKING TEMPERATURE WAS SET FOR TOP & BOTTOM HEAT AT 350 DEG. F
THE CONVEYOR SPEED WAS SET - AT 14

AFTL FABRICATED A TEST HOOD. THE CONVEYOR OVEN WAS ON A TABLE INSIDE OF THE HOOD.

THE OVEN WAS PRE-HEATED TO 325 DEG. F

THE HOOD WAS CONNECTED TO A TEST PLENUM AND 500 CFM OF AIR WAS EXHAUSTED THROUGH THE TEST SET-UP

WITHIN THE TEST DUCT 2 LAYERS OF ASHRAE 95% MEDIA WAS PLACED IN SERIES TO CAPTURE ANY PARTICULATE MATTER BEING GENERATED DURING THE TEST. THE TWO LAYERS OF MEDIA WERE WEIGHED BEFORE AND AFTER THE TEST.

UPSTREAM OF THE MEDIA A PROBE WAS INSERTED TO SAMPLE THE EXHAUST AIR STREAM IN ACCORDANCE WITH EPA METHOD 202

EPA METHOD 202 IS A TECHNIQUE FOR SAMPLING A SMALL PART OF OF THE TOTAL EXHAUST AIR. IT CONSISTS OF A PARTICULATE FILTER HOLDER, 4 IMPINGER BOTTLES IN SERIES, THE FIRST TWO CONTAIN 100 ml OF DISTILLED WATER, THE THIRD IS EMPTY (TO CATCH ANY OVERFLOW), AND THE FOURTH CONTAINS SILICA GEL, A SUBSTANCE USED TO ABSORB MOISTURE FROM THE GAS STREAM. THE BOTTLES ARE PLACED INTO AN INSULATED CONTAINER PACKED WITH ICE. THE PROBE, BOTTLES, AIRFLOW METER, GAS METER ARE CONNECTED TO A VACUUM PUMP. THE SAMPLING RATE IS ABOUT 1 CFM.

AFTER THE TEST IS COMPLETED THE WATER IS MEASURED AND MIXED WITH METHYLENE CHLORIDE, PLACED IN A SEPARATORY FUNNEL, VIGOROUSLY SHAKEN, THEN ALLOWED TO SEPARATE THE MC FROM THE WATER. THE MC IS EVAPORATED TO DRYNESS.

EPA	METHOD	202	PARTICULATE FILTER RESULTS			
METER	METER	ACF	TEMP	PRESSURE	SCF	CUBIC
INITIAL	FINAL			IN. Hg		METERS
949.58	33.19	83.61	82	3	73.56	2.08

INITIAL	FINAL	GAIN	CONC.	
WEIGHT	WEIGHT	GRAMS	AS mgs.	mgs/m ³
0.97034	0.9705	0.00016	0.16	0.077

METHYLENE CHLORIDE EXTRACTION METHOD - NO GREASES DETECTED
ALLOWABLE CONCENTRATION IS 5.0 MILLIGRAMS PER CUBIC METER.