Quizno's Hood Submittal Documents

Qvent™

Qvent™ over Holman conveyor

Qvent™ *is a custom ventilation solution engineered specifically to vent Holman QT-14 conveyor warmers used in Quizno's operations.* The process of warming a Quizno's sandwich in the specially designed Holman QT-14 conveyor warmer is not a cooking process. The FDA Food Code defines cooking (NFPA 96 and model building code provide no definitions for "cooking") whereby the internal temperature of a menu item is at least 145°F for a minimum of 15 seconds. The Quizno's warming process for our ready to eat sandwiches provides for a maximum attained product surface temperature of 130°F; whatever effluent is produced is not significant and does not pose a fire hazard.

Type II application

The Quizno's process of warming sandwiches in the Holman QT-14 conveyor warmer produces far less grease and smoke than the allowable amounts as stipulated by industry consensus standards (EPA 202). The EPA 202 test method was originally intended for recirculating hood systems and as such, defines a threshold level value (TLV) of condensable particulate as a concentration: $5mg/m^3$. 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.

Hood

With this Type II application; there are no requirements for all welded liquid tight ducts with rated shaft-wall enclosures, fire suppression systems or specific duct transport velocities. When installed in accordance with these instructions the ducts can be pressure washed as needed without leakage or damage to adjacent environmental surfaces. Nonetheless, as a "Best Design Practice" we use a hood listed to UL 710 and require type I installation methods throughout with the *exception* of fire suppression, rated shafts or fire wraps, or transport velocity criteria.

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 fastened 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 fastened to the hoods duct collar. On the discharge end of the duct we are providing some welded angles to enable connection of all-thread 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 duct section that will close from the discharge side of our SS duct section to the UL 762 fan mounted on a 22"H hinged curb. An alternate to the all welded liquid tight 16ga steel duct (or 18ga stainless steel) is the use of a manufactured and UL listed Class A chimney product such as those provided by Metal-Fab, Inc., Wichita Kansas, 800-835-2830, model PIC or IPIC (or equal) installed pursuant to the manufacturers instructions.

Replacement air

Due to the proximity of the inlet to the conveyor warmer, only low exhaust volumes (800CFM Approx.) 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. Most stores do not need an electrical interlock for replacement air as the use of this system together with other exhausts does not cast the space into a negative pressure condition beyond -0.02"W.C. pursuant of NFPA 96 (8.3.1) or that of IMC sec 508.1. When site conditions are such that negatives will exceed -0.02"W.C., the HVAC system must used to provide roughly 750CFM of tempered (and air conditioned) fresh air. 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 ***Qvent™***

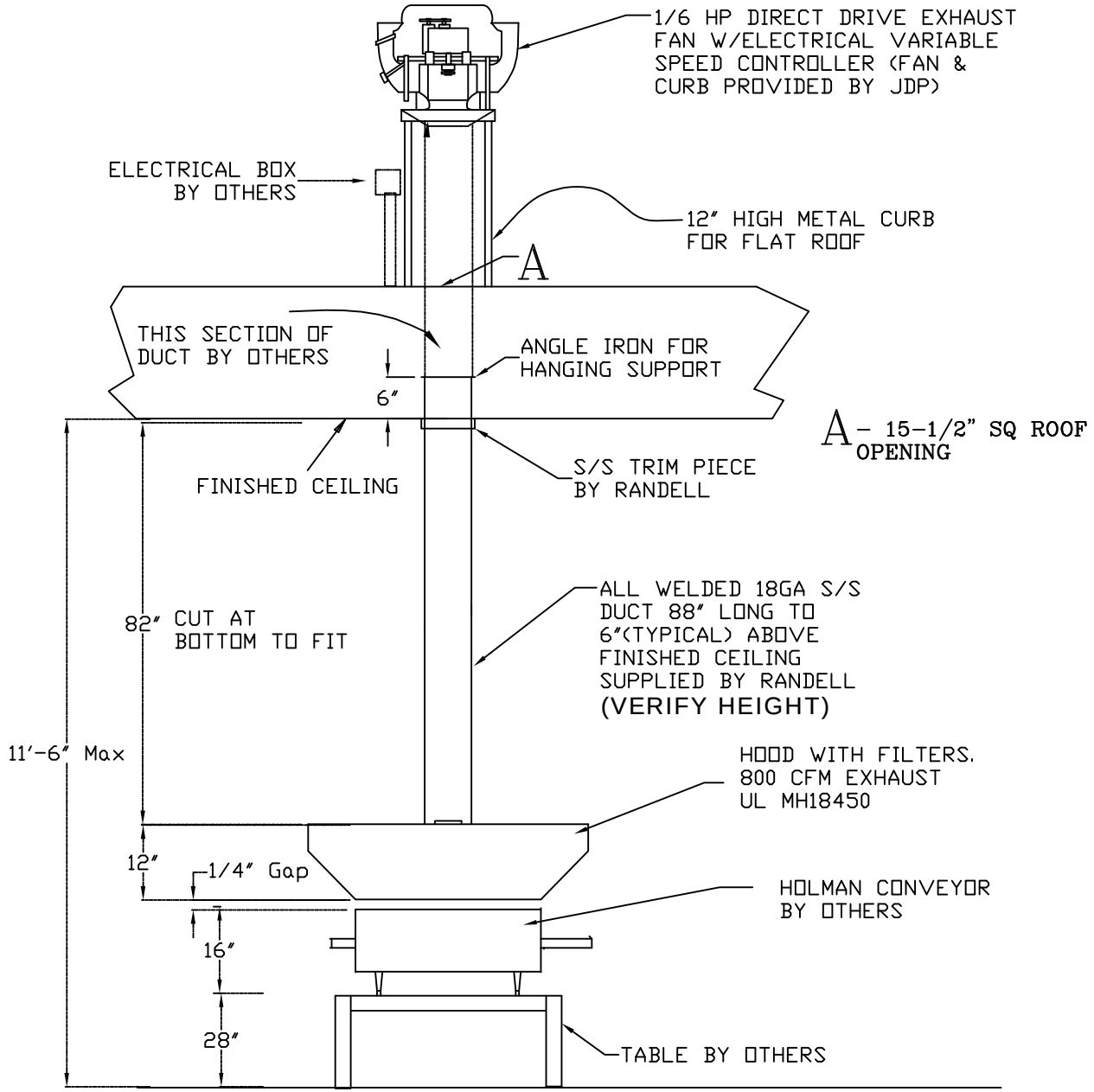
Exhaust Fan

The standard ***Qvent™*** exhaust fan (UL 762 listed) 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 electrical hook up 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. Fans will move enough air to work with double toaster situations. Duct runs greater than 20 feet, with offsets, or sidewall discharge will require the use of a fixed speed belt drive fans. Note that the fan does tip for duct cleaning as needed, and with the 22" high roof curb we comply with the 40" distance from point of discharge to roof line.

Documentation

Please find the attached documents:

1. Drawing of hood, duct, fan and curb.
2. Letter of interpretation from IAPMO (UMC)
3. Two hour EPA 202 test from Food Service Technology Center, San Ramon (PG&E)
4. EPA 202 testing from air and filter testing laboratories



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

SALES CONTACT:*
ORIG. DWG. DATE:03/25/99CR
REVISION DATES

QUIZINOS
JOHNSON DIVERSIFIED

Q\VENT SYSTEM

Randell
A DOVER INDUSTRIES COMPANY
0520 South Coldwater Road
Weidman, Michigan 48893-9683
Phone 1-800-621-8560
Fax 1-800-634-5369

APPROVED DRAWING REQUIRED BEFORE FABRICATION
☐ DRAWING APPROVED
☐ APPROVED AS NOTED
☐ RESUBMIT DRAWING
SCHEDULED SHIP DATE:
SIGNATURE:

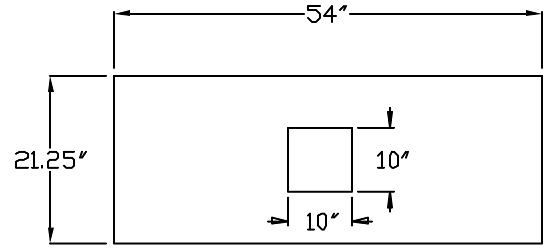
RANDELL MANUFACTURING IS LISTED WITH NSF INTERNATIONAL UNDER STANDARD 2 FOR CUSTOM BUILT FOOD SERVICE EQUIPMENT; STANDARD 4 FOR COMMERCIAL COOKING EQUIPMENT, STANDARD 7 FOR FOOD SERVICE REFRIGERATORS AND STORAGE FREEZERS; AND STANDARD CRITERIA C-2 FOR HOT/COLD COMBINATION FOOD WELLS.

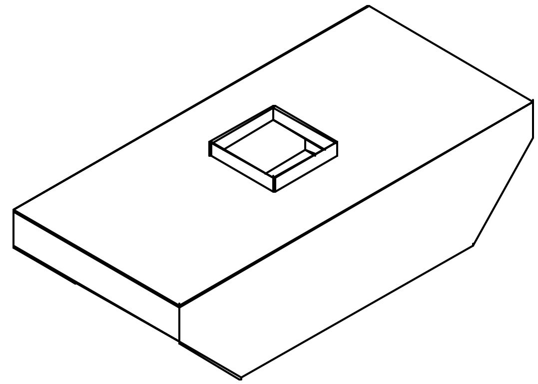
NOTE: IF YOU ARE PLACING EQUIPMENT INTO AN AREA WHICH HAS CERTAIN STANDARDS OR CODES OTHER THAN THOSE NORMALLY ACCEPTED IN THE FOODSERVICE INDUSTRY (NSF, UL, ETC.) RANDELL MUST BE ADVISED OF THESE SPECIFICATIONS IN DETAIL BEFORE FABRICATION OF THE EQUIPMENT BEGINS IN ORDER THAT RANDELL MAY QUOTE ADDITIONAL COST IF ANY. FAILURE TO NOTIFY RANDELL MANUFACTURING INC. BEFORE FABRICATION BEGINS RELEASES US FROM ANY OBLIGATION TO MODIFY OUR STANDARDS WITHOUT ANY ADDITIONAL CHARGES.

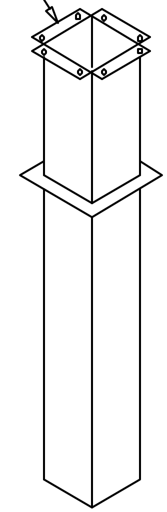
UL LISTED 197, 471, 710, & 763

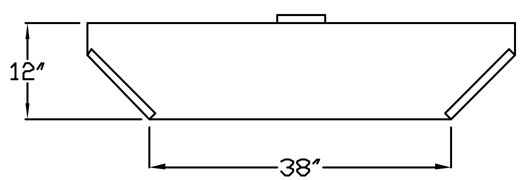
DATE:

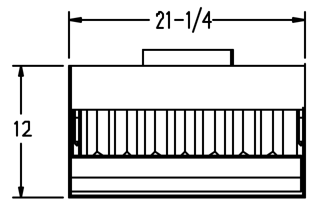
10" X 10" 18 GA S/S DUCT EXTENSION
WITH 1 1/2" WIDE PERIMETER CEILING TRIM
AND (4) 1 1/2"ANGLE X 8"LONG HANGING BRKTS
VERIFY HEIGHT REQUIREMENTS











Hood Item No.	Hood Length (IN.)	Hood Width (IN.)	Hood Weight (LBS)	Exhaust Rate (UN.FT.)	Exhaust C.F.M.	Exhaust Duct Size (IN.)	Exhaust Duct Velocity (F.P.M.)	Net Filter Area (SQ.FT.)	Velocity Thru Filters (F.P.M.)	Exhaust Static Pressure (IN.)	Supply C.F.M.	Supply Air Duct Size	Avg. Air Velocity Thru Diffus. (F.P.M.)
ITEM 1	54	21.25	70	226	800	10 X 10	1152	2.0	400	.45			

GENERAL NOTES

IF YOU ARE INSTALLING A VENTILATION EXHAUST SYSTEM INTO AN AREA WHICH HAS CERTAIN STANDARDS OR CODES OTHER THAN THOSE NORMALLY ACCEPTED IN THE FOOD-SERVICE INDUSTRY {NSF, UL, ETC. } RANDELL MUST BE ADVISED OF THESE SPECIFICATIONS IN DETAIL BEFORE FABRICATION OF THE EQUIPMENT BEGINS. FAILURE TO ADVISE RANDELL 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 RANDELL HOODS MEET ONE OR MORE OF THE FOLLOWING:

U.L.710 MH18450 2/16/99
BOCA ICBO
NSF STANDARD(2)
STATE OF MICHIGAN
SBCCI NFPA 96

KEY

SUPPLY DUCT

EXHAUST DUCT

ORIGINAL QUOTE DATE 2/16/99

ORIGINAL DRAWING DATE

DATE QUOTE LAST REVISED

DATE DRAWING LAST REVISED 11/22/02

REASON Increase Duct to 10x10

SALES Paul Johnson 800.676.8488 x111

QUOTE # QUIZINOS	SALES CONTACT: *		HOOD MODEL VCP JOHNSON DIVERSIFIED
	ORIG. DWG. DATE 03/25/99GR		
ORDER # *	REVISION DATES		HOLMAN WARMER QVENT
	11/22/02		
	QVENT2		
SHT 1 OF 1			
SCALE 1/2 "=1'-0"			

Randell
A [illegible] INDUSTRIES COMPANY

1520 South Coldwater Road
Weidman, Michigan 48893-9683
Phone 1-800-621-8560
Fax 1-800-634-5369

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SIGNATURE:

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U.L. LISTED 197, 471, 710, & 763

DATE:

COOK

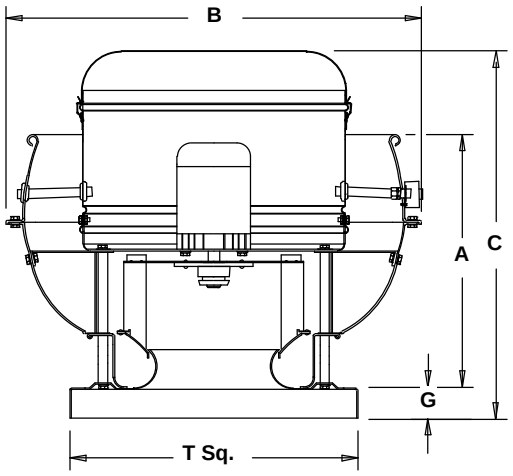
MARK: STD ROOF TOP
PROJECT: Q135V10DR
DATE: 02-06-2002

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)

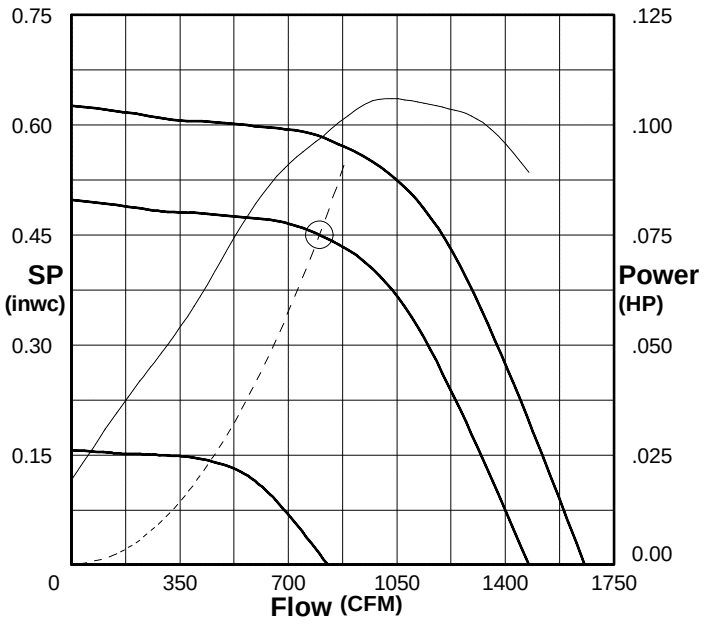
A	19-1/16
B	30-3/16
C	28-5/8
G	2
T Sq.	20
Roof Open. Sq.*	15-1/2
Unit Wt(lbs)***	105

* 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

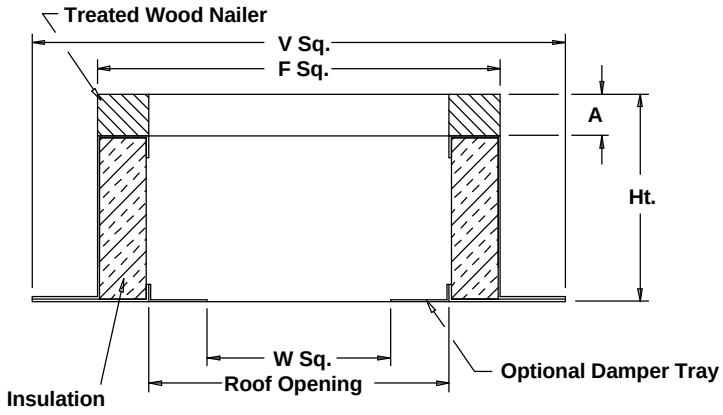
Galvanized Steel Roof Curb

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)

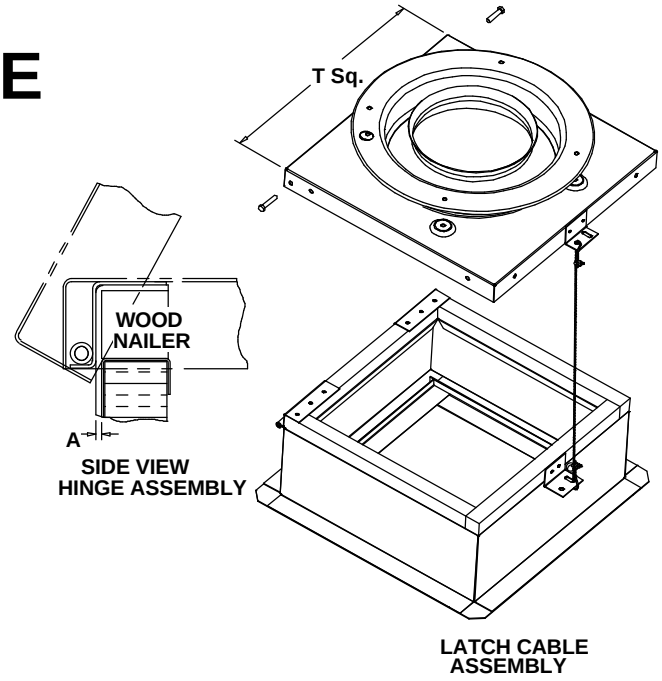
Mark	Qty	Description	Ht	Options*	A	F Sq.	V Sq.	W Sq.	Roof Opening
STD ROOF TOP	1	RCG 18	13.5	1	1-1/2	18-1/2	22-1/2	11-3/4	15-1/2

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

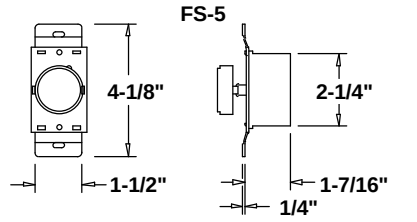
Fan Speed Controls

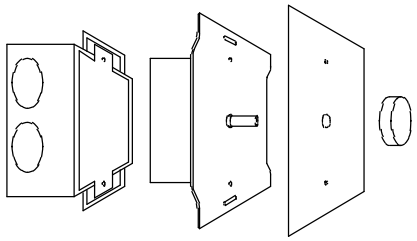
STANDARD CONSTRUCTION FEATURES:

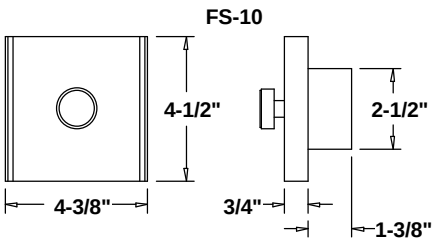
PRODUCT DESCRIPTION - Through the "Quadrac" integrated semi-conductor device it is now possible to offer this system with many advantages. Fewer semi-conductor parts mean greater reliability and the passivation process used in the manufacture of the semi-conductor insures long life. Printed circuit construction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

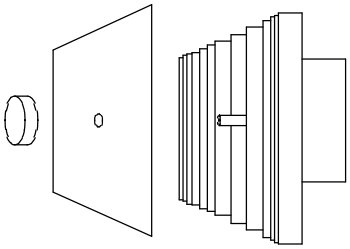
Dimensions (inches)

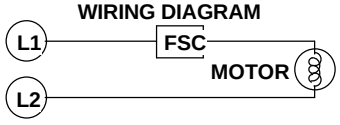
Mark	Qty	Description
STD ROOF TOP	1	FSC 5 AMP 120 VOLT











INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS

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Fax 1-909-594-5265

September 30, 2002

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

Roger Rotundo
Chairman, UMC Interpretations Committee
Ext. 138

Tom Johnson

From: David Zabrowski [dzabrowski@fishnick.com]
Sent: Wednesday, December 04, 2002 10:37 AM
To: Thomas Johnson (E-mail)
Cc: Don Fisher (E-mail)
Subject: Quizno's emissions results

Tom,

The 2-hr emission test conducted on the Holman QT-14 Conveyor Belt Oven on September 25, 2002 using a typical mixture of Quizno's product yielded a total condensable particulate emission concentration of 1.918 mg/m3 at a ventilation rate of 200 cfm. Normalizing these results to a nominal 500 cfm ventilation rate yields a total condensable particulate emission concentration of 0.767 mg/m3.

Please call me at (925) 866-5614 if you have any questions.

Regards,
David Zabrowski

AIR FILTER TESTING LABORATORIES, INC.

4632 OLD LA GRANGE ROAD | CRESTWOOD, KENTUCKY 40014

PHONE | FAX (502)222-5720

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

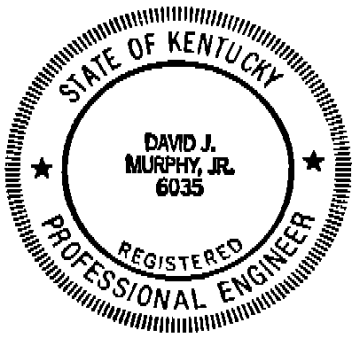
ALLOWABLE CONCENTRATION IS 5.0 MILLIGRAMS PER CUBIC METER.

APPROVAL

TEST SUPERVISOR RJB,RS

DATE 7-25-1996

ENGINEERING APPROVAL David J Murphy Jr



AIR FILTER TESTING LABORATORIES, INC.

4632 OLD LA GRANGE ROAD | CRESTWOOD, KENTUCKY 40014

PHONE | FAX (502)222-5720

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 INITIAL	METER FINAL	ACF	TEMP	PRESSURE IN. Hg	SCF	CUBIC METERS
949.58	33.19	83.61	82	3	73.56	2.08

INITIAL WEIGHT	FINAL WEIGHT	GAIN GRAMS	AS mgs.	CONC. 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.